

A rationalization of names in *Haworthia*: a list of species with new combinations and new synonyms

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With the impending revision of the IOS Succulent Lexicon and a growing awareness that the current classification of the genus *Haworthia* is unnatural, the time is ripe to propose a list of species names that I (MBB) consider worthy of recognition. My considered opinion is that there are at most about 60 species in *Haworthia* and that a better and more critical treatment would reduce this still more. This contrasts markedly with Breuer (2010), who lists 368 'accepted' species and reports the even more startling claim that Hayashi recognises 550! Some of this increase is due to the tendency for these authors to treat my varietal names as full species but they have also described many new species de novo. They, as well as Gerhard Marx, who recently also entered the fray with some very harsh words for me, have my considerable respect for their talents and enthusiasm but I am unable to accept all of their proposed taxa in the context of my extensive field knowledge of the genus and my practical experience of patterns of variation among wild populations.

Species concepts in the genus have always been idiosyncratic, driven primarily by a propensity to recognize variation over similarity and fostered by a general ignorance of the extent of intra-population variability in the wild. The recent almost exponential proliferation of names has succeeded in surrounded the genus with a thicket of nomenclatural twigs that is almost possible to penetrate and which obscures rather than illuminates any real understanding of the genus. The very appeal of the genus is its almost infinite capacity to vary, and it is a tragedy that they are no longer appreciated for their individuality but are instead pushed into or pulled out of taxonomic boxes almost willynilly. It is very difficult not to suspect the motivation behind some of this bedlam.

While we in no way wish to proscribe anybody from expressing their opinions, we issue an urgent plea for restraint. The nomenclatural flood that has all but submerged the genus will only be exacerbated by floating additional formal names and combinations on the turbulent waters. In fact, we go so far as to recommend a moratorium on the publication of any new taxa in the genus that are proposed without an extensive survey of relevant variation patterns in the wild. Scientific journals reduce the chances that inadequately researched papres will see the light of day by sending all submissions to competent referees for comment and evaluation. Popular journals that transgress into the scientific arena by accepting descriptions of new taxa should do the same and the responsibility for this lies firmly with the editors.

Every scientific name that enters currency has to be accounted for by botanists in their lists and publications. To remove them from circulation requires a separate, formal act for each and every name. Dealing with the many dubious names in *Haworthia* is taxing task that can be ill afforded. Numerous invalidly published or illegitimate names have also entered circulation through non-adherence to the International Code of Botanical Nomenclature, which aims to regulate scientific names. This adds to the confusion and to the work.

What in fact is the primary purpose of these scientific names? Among botanical circles, species names carry a great deal of weight. In most instances they imply that individuals that share a name also share a common ancestry and can interbreed to produce viable seeds. Species with different names will not. Is this philosophy applied in *Haworthia*? The process of recognising species in botanical circles is generally top-down, with genera being first split into component species and the species then into subspecies or varieties according to the particular patterns of variation shown by the constituent populations. This does not seem to apply in *Haworthia*. Here the process is largely bottom-up, with individuals or populations being given names and then shuffled into or among species. This is patently absurd.

In general terms, botanical names largely reflect similarities whereas horticultural names highlight differences. The two systems are thus not always congruent and little is to be served by confusing them. We therefore recommend that growers exploit the advantages of an informal system of nomenclature that will give them unlimited flexibility without clogging up the formal nomenclature any further. We also urge the Editors of popular journals to encourage the use of this system among their contributors. The great advantage of such an informal and non-ranked system is that it removes the hierarchical constraints that are inherent in the Linnaean system and that have already created problems with the placement of varieties and forms of *Haworthia*.

It could not be easier to implement and use: instead of worrying about the taxonomic level at which the variant is to be recognized (is it a subspecies, or a variety, or a form) the name appears in inverted commas without any indication of its rank. Such informal names can also be moved between species without any formal changes that are otherwise necessary. They are likely to be more descriptive and meaningful than a bare Latinised trivial epithet. As an example, should Mr Smith consider that the form of *H. mirabilis* var. *sublineata* from south of Bredasdorp with paler, attenuate leaves deserves special recognition, then he might usefully refer to those plants under the informal name *H. mirabilis* 'Bredasdorp Pale' Smith 2015. A typical illustration should be designated to fix the application of the name. Transferring of the variant to another species should follow the Zoological Code in carrying over the first author only (now in brackets) and not the transferring author as well. Thus: *H. mirabilis* 'Bredasdorp Pale' (Smith 2015).

THE LIST: All taxa that we accept are indicated in **bold**. Taxa that are not accepted at any rank are included as synonyms. Where possible we formally synonymise such names that have not yet been formally synonymised but many others (indicated with an asterisk *) do not appear in the International Plant Names Index (www.ipni.org) as of 20 January 2012 and are thus evidently unpublished or manuscript name. The publication of such names in the literature is irresponsible. Names that are separated by a full stop (.) are based on different types (heterotypic or taxonomic synonyms) whereas those separated by a colon (:) are based on the same type (homotypic or nomenclatural synonyms).

Haworthia Duval Pl. Succ. Horto. Alenc.: 7pp (1809). Baker in Jl. S. Afr. Bot. 18: 197(1880). Baker in Fl. cap. 6: 332 (1896). Berger in Das. Pfl. 4: 74 (1908). Bayer, New *Haworthia* Handb. (1982). Scott, The genus *Haworthia* (1985). Type species: *H. arachnoidea* (L.) Duval. [Typification largely by Breuer & Metzger in Taxon (1996)].
= *Catevala* Medik. (1786). *Apicra* Willd. (1811).

± 60 species, very variable and complex. The taxonomy of the genus is still unresolved. Species concepts used here largely follow Bayer's (1976, 1982, 1997 and subsequent *Haworthia* Update volumes) treatments and are based on geographical distribution and co-occurrence.

NOTE: Recent phylogenetic analyses of nuclear and plastid DNA sequence data supports the view that the three subgenera comprise quite distinct lineages not immediately related to one another. They are thus as distinct as some of the other smaller genera and should thus logically be treated as separate genera. A more useful option is probably to include all of the alooid genera within *Aloe*.

Key to the subgenera

1. Flowers triangular or rounded-triangular at base; tube obclavate-curved; outer tepals free; style upcurved; seeds irregularly angled . . . subg. *Haworthia*
2. Flowers hexangular at base, gradually narrowing to junction with pedicel (substipitate); tube obcapitate-curved; outer tepals partly fused to inner; style straight; seeds irregularly angled . . . subg. *Hexangulares*
3. Flowers rounded at base and abruptly joined to pedicel (non-stipitate); petals partly fused; tube obcapitate-straight; style straight; seeds flattish . . . subg. *Robustipedunculatae*

I. Subgenus *Haworthia*. Type species: as for genus. ± 41 spp.

H. angustifolia Haw. in Philos. Mag. J. 66: 283 (1825). Neotype, designated by Breuer & Metzinger (1997): Grahamstown to Alicedale, *Bruyns 1653* (NBG).
= *Aloe stenophylla* Schult. & Schult.f. (1829). *H. albanensis* Shonl. (1912). *H. angustifolia* var. *grandis* Smith (1943).

H. angustifolia var. ***angustifolia***

H. angustifolia var. ***altissima*** Bayer in Haw. Revis.: 26 (1999): *H. altissima* (Bayer) M.Hayashi in *Haworthia Study 3*: 13 (2000). Type: Riebeeck East to Carlisle Bridge, *Smith 5220* (NBG).

H. angustifolia var. ***baylissii*** (Scott) Bayer in Haw. Revis.: 27 (1999): *H. baylissii* Scott (1968). Type: Oudekraal, Zuurberg, *Bayliss sub Scott 796* (PRE).

H. angustifolia var. ***paucifolia*** Smith in J. S. Afr. Bot. 14: 48 (1948): *H. paucifolia* (Smith) M.Hayashi in *Haworthia Study 22*: 11 (2010). Type: Frazers Camp, *Smith 6819* (NBG).

H. arachnoidea (L.) Duval in Pl. Succ. Hort. Alenc.: 7 (1809): *Aloe pumila* var. *arachnoidea* L. (1753): *Catevala arachnoidea* (L.) Medik. (1786): *Apicra arachnoidea* (L.) Willd. (1811). Lectotype, designated by Scott (1977): Commelin, *Praeludia Bot.*: t. 27 (1703). Epitype, designated by Breuer & Metzinger (1997): Buitenstekloof, Langvlei, *Bayer 153* (NBG).
= *H. arachnoidea* var. *minor* Haw. (1819).

H. arachnoidea var. ***arachnoidea***

= *H. joubertii* M.Hayashi in *Haworthia Study 14*: 16 (2005), nom. inval. *H. laxa* M.Hayashi in *Haworthia Study 14*: 14 (2005), nom. inval. *H. limbata* M.Hayashi in *Haworthia Study 14*: 16 (2005), nom. inval. **H. isomorpha* **H. gilva*

H. arachnoidea var. ***aranea*** (Berger) Bayer in Haw. Revis.: 30 (1999): *H. bolusii* var. *aranea* Berger (1908): *H. aranea* (Berger) Bayer (1976). Lectotype: Engler, *Pflanzenr.* 33: 114, f. 39 A–E (1908). Epitype, designated by Breuer & Metzinger (1997): Robinson Pass, Moeras River Drift, *Bolus 12372* (BOL).

H. arachnoidea var. ***namaquensis*** Bayer in Haw. Revis.: 31 (1999): *H. namaquensis* (Bayer) Breuer in *Gen. Haworthia 1*: 7 (2010). Type: Karrachabpoort, Richtersveld, *Bayer 1674* (NBG).

H. arachnoidea var. ***nigricans*** (Haw.) Bayer in Haw. Revis.: 32 (1999): *H. setata* var. *nigricans* Haw. (1821). Neotype, designated by Bayer (1997): SW Vanwyksdorp, *Bayer 2419* (NBG).

= *H. helmia* V.Poelln. (1937): *H. unicolor* var. *helmia* (V.Poelln.) Bayer (1976). *H. venteri*

V.Poelln. (1939): *H. unicolor* var. *venteri* (V.Poelln.) Bayer (1976). *H. scottii* Breuer in Avonia 21: 55 (2003), **syn. nov.** *H. nigrata* M.Hayashi in Haworthia Study 15: 14 (2006), **syn. nov.** **H. apata* **H. regens* **H. formosa* **H. kuromisa*
H. arachnoidea var. **scabrispina** Bayer in Haw. Revis.: 34 (1999): *H. scabrispina* (Bayer) Breuer in Gen. Haworthia 1: 8 (2010). Type: Bavians, Bayer 2105 (NBG) **H. matjesta*
H. arachnoidea var. **setata** (Haw.) Bayer in Haw. Revis.: 34 (1999): *H. setata* Haw. (1819).
Iconotype: artist unknown, specimen received from Dr Mackrill ex Cape (K).
= *H. setata* var. *media* Haw. (1821). *H. setata* var. *major* Haw. (1821). *Aloe setosa* Schult. & Schult.f. (1829). *H. gigas* V.Poelln. (1932): *H. setata* var. *gigas* (V.Poelln.) V.Poelln. (1938). *H. minima* var. *major* V. Poelln. (1938): *H. tenera* var. *major* (V.Poelln.) Uitew. (1948). *H. pectinis* M.Hayashi in Haworthia Study 10: 13 (2003), **syn. nov.** *H. tetryrensis* Breuer in Avonia 21: 58 (2003), **syn. nov.** *H. candida* M.Hayashi in Haworthia Study 16: 16 (2006), **syn. nov.** *H. cangoensis* M.Hayashi in Haworthia Study 14: 13 (2005), nom. inval. *H. angiras* M.Hayashi in Haworthia Study 14: 13 (2005), nom. inval. *H. kogmansensis* M.Hayashi in Haworthia Study 14: 14 (2005), nom. inval.

H. aristata Haw. in Suppl. Pl. Succ.: 51 (1819). Iconotype: (K). Epitype: Deadman's Gulch (Soutkloof), *Smith* 3550 (NBG).
= *H. denticulata* Haw. (1821). *H. lapis* Breuer & M.Hayashi in Alsterworthia Int. Special Issue 7: 6 (2004), **syn. nov.** *H. rava* M.Hayashi in Haworthia Study 14: 11 (2005), nom. inval.

H. bayeri Hammer & Venter in Cact. Succ. J (US) 69: 75 (1997). Type: S Uniondale, *Stayner* in *KG164/69* (NBG).
= *H. hayashii* M.Hayashi in Haworthia Study 7: 14 (2002), **syn. nov.** *H. laeta* M.Hayashi in Haworthia Study 12: 13 (2004), **syn. nov.** *H. indigoa* M.Hayashi in Haworthia Study 12: 13 (2004), **syn. nov.** *H. truterorum* Breuer & Marx in Aloe 48: 54 (2011), **syn. nov.**

H. blackburniae Barker in J. S. Afr. Bot. 3:93 (1937). Type: Calitzdorp, *Reynolds* 1842 (NBG).
H. blackburniae var. **blackburniae**
H. blackburniae var. **graminifolia** (Smith) Bayer in Haw. Revis.: 42 (1999): *H. graminifolia* Smith (1942). Type: Schoemanspoort, *M. Courtenay-Latimer* in *Smith* 5222 (NBG).
H. blackburniae var. **derustensis** Bayer in Haw. Revis.: 41 (1997): *H. derustensis* (Bayer) M.Hayashi in Haworthia Study 3: 13 (2000). Type: W. De Rust, *Vlok sub Venter* 93/24 (NBG).

H. bolusii Baker in J. Linn. Soc. Bot.:215 (1880). Type: Graaff-Reinet, *Bolus* 158 (K).
= *H. odetteae* Breuer in Avonia 21: 51 (2003), **syn. nov.** *H. odyssei* M.Hayashi in Haworthia Study 14: 11 (2005), nom. inval. *H. capillaris* M.Hayashi in Haworthia Study 16: 16 (2006), **syn. nov.**

H. bolusii var. **bolusii**

H. bolusii var. **blackbeardiana** (V. Poelln.) Bayer in Haw. Hand.: 31 (1976): *H. blackbeardiana* V.Poelln. (1932). Lectotype, designated by Breuer & Metzger (1997): ex cult. V.Poelln. 1932 (B).

= *H. blackbeardiana* var. *major* V.Poelln. (1937). *H. inermis* V.Poelln. (1932): *H. altilinea* var. *inermis* (V.Poelln.) V.Poelln. (1937): *H. altilinea* var. *limpida* f. *inermis* (V.Poelln.) V.Poelln. (1940). *H. batteniae* Scott (1979). *H. calaensis* Breuer in Alsterworthia Int. Special Issue 7: 5 (2004), **syn. nov.** *H. specksii* Breuer in Alsterworthia Int. Special Issue 7: 8 (2004), **syn. nov.** **H. hogsia* **H. speciosa* **H. malvina*

H. bolusii var. **pringlei** (Scott) Bayer in Haworthia 16: 62 (2002). *H. decipiens* var. *pringlei* (Scott) Bayer in Haw. Revis.: 67 (1999): *H. pringlei* Scott (Bradleya 12:103,1994). Type:

Adelaide district, *Scott s.n. PRE 8970* (PRE). *H. hisui* M.Hayashi in *Haworthia Study* 12: 10 (2004), **syn. nov.** *H. lazulis* M.Hayashi in *Haworthia Study* 14: 11 (2005), nom. inval. *H. aquamarina* M.Hayashi in *Haworthia Study* 10: 13 (2003), **syn. nov.** *H. hastata* M.Hayashi in *Haworthia Study* 12: 9 (2004), **syn. nov.**

H. chloracantha Haw. in *Revis.*:57 (1821): *Aloe chloracantha* (Haw.) Scult. & Schult.f. (1829). Neotype, designated by Breuer & Metzger (1997): N Herbertsdale, *Bayer KG411/75* (NBG).

H. chloracantha var. **chloracantha**

H. chloracantha var. **denticulifera** (V.Poelln.) Bayer in *Haw. Hand.*: 112 (1976): *H. angustifolia* var. *denticulifera* V.Poelln. (1937): *H. denticulifera* (V.Poelln.) M.Hayashi in *Haworthia Study* 3: 13 (2000). Type (icono.): (B).

= *H. angustifolia* var. *lilliputana* Uitew. (1953).

H. chloracantha var. **subglauca** V.Poelln. in *Kakteenkunde* 9:135 (1937): *H. subglauca* (V.Poelln.) M.Hayashi in *Haworthia Study* 3: 13 (2000). Neotype, designated by Breuer & Metzger (1997): Great Brak, *Hurling & Neil* (BOL).

H. cooperi Baker in *Refug. Bot.* 4: 233 (1871). Type: Cape, *Cooper* (K).

= *H. vittata* Baker (1871).

H. cooperi var. **cooperi**

= *H. pallens* Breuer & M.Hayashi in *Alsterworthia Int. Special Issue* 7: 7 (2004), **syn. nov.** **H. turcosa* **H. elegans* **H. foeda* **H. yocans*

H. cooperi var. **dielsiana** (V.Poelln.) Bayer in *Haw. Revis.*: 51 (1999): *H. dielsiana* V.Poelln.

(1930): *H. pilifera* var. *dielsiana* (V.Poelln.) V.Poelln. (1940): *H. obtusa* var. *dielsiana*

(V.Poelln.) Uitew. (1948). Neotype, designated by Bayer (1999): Sheldon, A.J. *van der Merwe in Smith 1140* (NBG).

= *H. joeyae* Scott (1975).

H. cooperi var. **doldii** Bayer in *Haworthiad* 16: 65 (2002): *H. doldii* (Bayer) M.Hayashi in *Haworthia Study* 14: 11 (2005). Type: Chalumna, *Dold 3961* (GRA).

H. cooperi var. **gordoniana** (V.Poelln.) Bayer in *Haw. Revis.*: 52 (1999): *H. gordoniana*

V.Poelln. (1937): *H. pilifera* var. *gordoniana* (V.Poelln.) V.Poelln. (1938): *H. obtusa* var.

gordoniana (V.Poelln.) Uitew. (1948). Neotype, designated by Bayer (1999): Patensie, *Smith 3028* (NBG).

= *H. harryi* M.Hayashi in *Haworthia Study* 12: 9 (2004), **syn. nov.** *H. jeffreisi* M.Hayashi in

Haworthia Study 12: 10 (2004), **syn. nov.** *H. pusilla* M.Hayashi in *Haworthia Study* 12: 10

(2004), **syn. nov.** *H. ligulata* M.Hayashi in *Haworthia Study* 12: 6 (2004), **syn. nov.** *H. venetia*

M.Hayashi in *Haworthia Study* 12: 6 (2004), **syn. nov.** **H. brandea* **H. cineraria* **H.*

compressa **H. gelatina* **H. ionandra* **H. neritica* **H. silvicola* **H. tomentosa*

H. cooperi var. **gracilis** (V.Poelln.) Bayer in *Haworthiad* 16: 64 (2002): *H. gracilis* V.Poelln.

(1929). Neotype, designated by Bayer (1999): Hellspoor, *Britten* (PRE).

= *H. caerulea* M.Hayashi & Breuer in *Haworthia Study* 12: 7 (2004), **syn. nov.**

H. cooperi var. **isabellae** (V.Poelln.) Bayer in *Haworthiad* 16: 62 (2002): *H. gracilis* var.

isabellae (V.Poelln.) Bayer in *Haw. Revis.*: 77 (1999): *H. isabellae* V.Poelln. (1938). Neotype,

designated by Bayer: Humansdorp, Gamtoos bridge, *H. Hall sub NBG 68799* (NBG).

= *H. azurea* M.Hayashi in *Haworthia Study* 9: 12 (2003), **syn. nov.** *H. arabesqua* M.Hayashi in

Haworthia Study 12: 7 (2004), **syn. nov.** *H. bella* M.Hayashi in *Haworthia Study* 12: 8 (2004),

syn. nov. *H. florens* M.Hayashi in *Haworthia Study* 12: 11 (2004), **syn. nov.** *H. pilosa*

M.Hayashi in *Haworthia Study* 12: 7 (2004), **syn. nov.** *H. bathylis* M.Hayashi in *Haworthia*

Study 15: 116 (2006), **syn. nov.** *H. lachnosa* M.Hayashi in *Haworthia Study* 16: 16 (2006), **syn.**

nov. *H. ciliata* M.Hayashi in *Haworthia Study* 14: 11(2005), nom. inval. **H. kromia*. **H. patriae*

**H. cuprina* **H. dasylis*

H. cooperi var. **leightonii** (Smith) Bayer in Haw. Hand.: 128 (1976): *H. leightonii* Smith (1950). Type: Kayser's Beach, *Smith 6938* (NBG).

= *Haworthia leightonii* var. *davidii* Breuer in Avonia 21: 49 (2003), **syn. nov.**: *Haworthia davidii* (Breuer) M.Hayashi & Breuer (2005). Type: SW East London, *Breuer 6970* (TUAT).

**H. sabita*?

H. cooperi var. **minima** (Bayer) Bayer [as (Baker) Bayer], comb. et stat. nov.: *H. minima* Baker (1880) hom. illegit. non (Aiton) Haw. (1812): *H. gracilis* var. *minima* Bayer [as (Baker) Bayer] (1999). Iconotype: (K).

= *H. tenera* V.Poelln. (1932): *H. translucens* subsp. *tenera* (V.Poelln.) Bayer (1976): *H. gracilis* var. *tenera* (V.Poelln.) Bayer (1999): *H. cooperi* var. *tenera* (V.Poelln.) Bayer (2002). *H. cummingii* Breuer & M.Hayashi in *Haworthia Study* 10: 4 (2003), **syn. nov.**

H. cooperi var. **picturata** (Bayer) Bayer in *Haworthiad* 16: 65 (2002): *H. gracilis* var. *picturata* Bayer (1999): *H. picturata* M.Hayashi (2000). Type: Enon, *Thode 21507* (NBG).

= *H. oculata* M.Hayashi in *Haworthia Study* 12: 10 (2004), **syn. nov.** **H. florida* **H. imperialis* **H. kubusie*

H. cooperi var. **pilifera** (Baker) Bayer in Haw. Revis.: 54 (1999): *H. pilifera* Baker (1871): *H. obtusa* var. *pilifera* (Baker) Uitew. (1948). Iconotype: Refug. Bot.: 234 (1871).

= *H. stayneri* V.Poelln. (1937): *H. pilifera* var. *stayneri* (V.Poelln.) V.Poelln. (1938): *H. obtusa* var. *stayneri* (V.Poelln.) Uitew. (1948). *H. stayneri* var. *salina* V.Poelln. (1937): *H. pilifera* var. *salina* (V.Poelln.) V.Poelln. (1938): *H. obtusa* var. *salina* (V.Poelln.) Uitew. (1948): *H. salina* (V.Poelln.) M.Hayashi (2010). *H. pilifera* var. *dielsiana* f. *acuminata* V.Poelln. (1940): *H. obtusa* var. *dielsiana* f. *acuminata* (V.Poelln.) Uitew. (1948). *H. luri* M.Hayashi in *Haworthia Study* 14:11 (2005), nom. inval. **H. sabrina*

H. cooperi var. **truncata** (Jacobs.) Bayer in Haw. Rev.: 55 (1999): *H. obtusa* var. *pilifera* f. *truncata* Jacobs in *Nat. Cact. Succ. J.* 10: 81 (1955): *H. ikra* Breuer (2010). Neotype, designated by Bayet (1999): Runlets, Mgwali, *Smith 5295* (NBG).

H. cooperi var. **venusta** (Scott) Bayer in Haw. Revis. (1999): *H. venusta* Scott in *Bradleya* 14:87 (1996). Type: NE Alexandria, *Britten 781* (GRA).

H. cooperi var. **viridis** (Bayer) Bayer in *Haworthiad* 16: 65 (2002): *H. gracilis* var. *viridis* Bayer (1999). Type: Perdepoort, *Smith 6867* (NBG).

= *H. hamata* M.Hayashi in *Haworthia Study* 10: 12 (2003), **syn. nov.** *H. emeralda* M.Hayashi in *Haworthia Study* 12: 11 (2004), **syn. nov.** *H. subhamata* M.Hayashi in *Haworthia Study* 12: 11 (2004), **syn. nov.** *H. teres* M.Hayashi in *Haworthia Study* 12: 7 (2004), **syn. nov.** **H. swannea*

H. cymbiformis (Haw.) Duv. in *Pl. Succ. Hort. Elenc.*:7 (1809): *Aloe cymbiformis* Haw. (1804): *H. concava* Haw., nom. illegit. superfl. (1821). Neotype, designated by Breuer & Metzinger (1997): Port Elizabeth, Walmer, *Smith 2844* (NBG).

= *H. planifolia* Haw. (1825): *H. cymbiformis* var. *planifolia* (Haw.) Baker (1880): *Aloe planifolia* (Haw.) Salm-Dyck (1840). *H. cymbiformis* var. *angustata* V.Poelln. (1938): *H. angustata* (V.Poelln.) Breuer in *Gen. Haw.* 1: 7 (2010). *H. cymbiformis* var. *angustata* f. *subarmata* V.Poelln. (1938). *H. cymbiformis* var. *compacta* Triebn. (1938): *H. compacta* (Triebn.) Breuer in *Gen. Haw.* 1: 7 (2010). *H. planifolia* var. *exulata* V.Poelln. (1938). *H. planifolia* var. *planifolia* f. *agavoides* Triebn. & V.Poelln. (1938), et f. *olivacea* Triebn. & V.Poelln. (1938), et f. *robusta* Triebn. & V.Poelln. (1938), et var. *incrassata* V.Poelln. (1938), et var. *sublaevis* V.Poelln. (1938), et var. *longifolia* Triebn. et V.Poelln. (1938), et var. *longifolia* f. *calochlora* Triebn. et V.Poelln. (1938). *H. planifolia* var. *poellnitziana* Resende (1943). *H. lepida* Smith (1944). **H. cana* **H. ingens* **H. plena* **H. rosea*

H. cymbiformis var. **cymbiformis**

H. cymbiformis var. **incurvula** (V.Poelln.) Bayer in Haw. Hand.: 124 (1976): *H. incurvula* V.Poelln. (1932). Neotype, designated by Breuer & Metzger (1997): Pluto's Vale, *Britten s.n.* BOL71307 (BOL).
H. cymbiformis var. **obtusata** (Haw.) Baker in J. Linn. Soc. Bot. 18: 209 (1880). *H. obtusata* Haw. in Phil.Mag. 46: 282 (1825). Iconotype: (K).
= *H. umbraticola* V.Poelln. (1937): *H. cymbiformis* var. *umbraticola* (V.Poelln.) Bayer (1976).
H. hillianiana V.Poelln. (1937): *H. umbraticola* var. *hillianiana* V.Poelln. (1938). *H. obtusata* var. *pilifera* f. *truncata* Jacobs. (1960). **H. blinkia*
H. cymbiformis var. **ramosa** (Smith) Bayer in Haw. Revis.: 60 (1999): *H. ramosa* Smith (1940): *H. cymbiformis* f. *ramosa* (Smith) Bayer (1976). Type: Wooldridge, *Smith 3168* (NBG).
H. cymbiformis var. **setulifera** (V.Poelln.) Bayer in Haw. Revis.: 62 (1999): *H. planifolia* var. *setulifera* V.Poelln. (1938): *H. setulifera* (V.Poelln.) Breuer (2010). Neotype, designated by Bayer (1999): Kwelegha Bridge, *Smith 5257* (NBG). *H. cymbiformis* var. *obesa* V.Poelln. (1938): *H. obesa* (V.Poelln.) Breuer. **H. sarcoidea*

H. decipiens V.Poelln. in Repert. Spec. Nov. Regni. Veg. 28: 103 (1930). Neotype, designated by Breuer & Metzger (1997): Prince Albert, Kleinsleutelfontein, *Bayer 5157* (NBG).
= *H. exilis* M.Hayashi in *Haworthia Study* 10: 12 (2003), **syn. nov.** *H. incrassa* M.Hayashi in *Haworthia Study* 14: 12 (2005), nom. inval. **H. tooris*
H. decipiens var. **decipiens**
H. decipiens var. **cyanea** Bayer in Haw. Revis.: 65 (1999): *H. cyanea* (Bayer) Hayashi (2000). Type: Fairview, W Jansenville, *Bayer 4180* (NBG).
= *H. amethystea* M.Hayashi in *Haworthia Study* 10: 1 (2003), **syn. nov.** *H. succinea* M.Hayashi in *Haworthia Study* 10: 14 (2003), **syn. nov.** *H. ianthina* M.Hayashi in *Haworthia Study* 14: 12 (2005), nom. inval. **H. virginea*
H. decipiens var. **minor** Bayer in Haw. Revis.: 66 (1999). Type: Kleinpoort, *Smith 3588* (NBG). **H. tenmari*
H. decipiens var. **virella** Bayer in *Haworthiad* 16: 63 (2002). Type: Ebenezer, *Bayer 2070* (NBG).
= *H. crinita* M.Hayashi in *Haworthia Study* 10: 13 (2003), **syn. nov.** *H. eminens* M.Hayashi in *Haworthia Study* 10: 13 (2003), **syn. nov.** *H. floccosa* M.Hayashi in *Haworthia Study* 10: 13 (2003), **syn. nov.** *H. kemari* M.Hayashi in *Haworthia Study* 9: 11 (2003), **syn. nov.** *H. fluffa* M.Hayashi in *Haworthia Study* 12: 9 (2004), **syn. nov.** *H. jansenvillensis* Breuer in *Alsterworthia Inst.* 4: 16 (2004), **syn. nov.** *H. pellucida* M.Hayashi in *Haworthia Study* 14: 12 (2005), nom. inval. **H. delicata* **H. ionides* **H. lanceata* **H. stewartia*
H. decipiens var. **xiphiophylla** (Baker) Bayer in *Haworthiad* 16: 63 (2002). *H. arachnoidea* var. *xiphiophylla* (Baker) Bayer in Haw. Revis.: 36 (1999). *Haworthia xiphiophylla* Baker, Curtis' Bot.Mag.: t. 7505 (1896). *H. setata* var. *xiphiophylla* (Baker) V. Poelln. (1938). Type: Uitenhage, *Howlett* (K).
= *H. longiaristata* V. Poelln. (1937). *H. flavida* M.Hayashi in *Haworthia Study* 10: 13 (2003), **syn. nov.** **H. kammaensis*

H. emelyae V.Poelln. in Repert. Spec. Nov. Regni. Veg. 42: 271 (1937). Lectotype, designated by Breuer & Metzger (1997): [unpublished image] (B).
= *H. blackburniae* V.Poelln. (1937). *H. correctata* V.Poelln. (1938). *H. picta* V.Poelln. (1938). *H. picta* var. *janvlokii* Breuer in *Avonia* 21: 52 (2003), **syn. nov.:** *H. janvlokii* (Breuer) Breuer (2010). *H. breueri* M.Hayashi in *Haworthia Study* 7: 14 (2002), **syn. nov.** *H. picta* var. *tricolor* Breuer in *Avonia* 21: 53 (2003), **syn. nov.:** *H. tricolor* (Breuer) M.Hayashi (2010). *H. marxii* Gildenh. in *Aloe* 44: 4 (2007), **syn. nov.**

H. emelyae var. **emelyae**

H. emelyae var. **comptoniana** (Smith) Hammer and Venter in Cact. Succ. J. (US) 69: 77 (1997):

H. comptoniana Smith (1945). Type: Georgida, *Malherbe sub Smith 3433* (NBG).

H. emelyae var. **major** (Smith) Bayer in Haw. Revis.: 70 (1999): *H. schuldtiana* var. *major* Smith (1946): *H. maraisii* var. *major* (Smith) Bayer (1976): *H. magnifica* var. *major* (Smith) Bayer (1977). Type: Garcia's Pass, *Smith 5370* (NBG).

= *H. wimii* M.Hayashi in Haworthia Study 3: 13 (2000), **syn. nov.**

H. emelyae var. **multifolia** Bayer in Nat. Cact. Succ. J. 34:31 (1979): *H. multifolia* (Bayer) M.Hayashi (2000). Type: Riversdale, Springfontein, *Bayer 1558* (NBG).

H. floribunda V.Poelln. in Repert. Spec. Nov. Regni Veg. 40: 149 (1936). Neotype, designated by Bayer (1982): [unpublished image] (B). Epitype, designated by Breuer & Metzger (1997): Blackdown, NE Heidelberg, *Bayer 158* (NBG). **H. henda*

H. floribunda var. **floribunda**

H. floribunda var. **dentata** Bayer in Haw. Revis.: 73 (1999): *H. dentata* (Bayer) M.Hayashi (2000), hom. illegit. non H.Jacobsen (1935). Type: W Riversdale, *Dekenah 90 sub Smith 5502* (NBG).

H. floribunda var. **major** Bayer in Haw. Revis.: 74 (1999). Type: S Swellendam, *De Kok* (NBG).

= *H. kondoi* M.Hayashi in Haworthia Study 3: 13 (2000), **syn. nov.**

H. herbacea (Mill.) Stearn in Cactus J. 7: 40 (1938): *Aloe herbacea* Mill. (1768). Lectotype, designated by Bayer (1972): Illustration in Boerhaave, Index Alter Hort. Lugd.-Bat. 2: 130: t. 131 (1720). Epitype, designated by Breuer & Metzger (1997): N Ribbokkop, *Bayer 161* (NBG). = *Aloe atrovirens* DC. (1799): *H. atrovirens* (DC.) Haw. (1821). *H. pumila* (Willd.) Duval (1809). *Aloe translucens* Haw. (1804): *H. translucens* (Haw.) Haw. (1819): *Aloe arachnoidea* var. *translucens* (Haw.) Ker-G. (1811). *H. pellucens* Haw. (1812). *H. pallida* Haw. (1821). *H. paynei* V.Poelln. in Feddes Repert. 41: 206 (1937), **syn. nov.**: *H. herbacea* var. *paynei* (V.Poelln.) Bayer (1999). *H. aegrota* V.Poelln. (1939). *H. submaculata* V.Poelln. (1939). *H. luteorosea* Uitew. (1939).

H. herbacea var. **herbacea**

H. herbacea var. **flaccida** Bayer in Haw. Revis.: 86 (1999): *H. flaccida* (Bayer) Breuer (2010). Type: Worcester, Rooiberg, *Bruyns* (NBG).

H. herbacea var. **lupula** Bayer in Haw. Revis.: 86 (1999): *H. lupula* (Bayer) M.Hayashi (2000). Type: Villiersdorp, Boscheveld Mt., Wolfkloof, *Esterhuysen* (NBG).

H. lockwoodii Archibald in Fl. Pl. Africa 20: f. 792 (1940). Type: near Laingsburg, *Lockwood-Hill 215* (GRA).

H. maculata (V.Poelln.) Bayer in Haw. Hand.: 130 (1976): *H. schuldtiana* var. *maculata* V.Poelln. (1940). Lectotype, designated by Breuer & Metzger (1997): Worcester, *Venter 6* (BOL). **H. audens*

H. marumiana Uitew. in Cact. Vetp. 6: 33 (1940). Type: Cape, Ladismith, *ex hort. Stellenbosch sub 6610* (AMD).

= *H. borealis* M.Hayashi in Haworthia Study 15: 14 (2006), **syn. nov.** *H. marmorata* M.Hayashi in Haworthia Study 15: 14 (2006), **syn. nov.** *H. tarkasia* M.Hayashi in Haworthia Study 15: 14 (2006), **syn. nov.** **H. euchlora*

H. marumiana var. **marumiana**

H. marumiana var. **archeri** (W.F.Barker ex Bayer) Bayer in Haw. Revis.: 104 (1999): *H. archeri* W.F.Barker ex Bayer (1981). Type: Whitehill, *Archer s.n. NBG 68145* (NBG). **H. chibita* **H. frazeri* **H. nudata*

H. marumiana var. **batesiana** (Uitew.) Bayer in Haw. Revis.: 105 (1999): *H. batesiana* Uitew. (1948). Type: Graaff-Reinet, *Ferguson* (AMD).

H. marumiana var. **dimorpha** (Bayer) Bayer in Haw. Revis.: 106 (1999): *H. archeri* var. *dimorpha* Bayer (1981): *H. dimorpha* (Bayer) M.Hayashi (2000). Type: Constable Station, W Laingsburg, *Hall sub Smith 7418* (NBG).

H. marumiana var. **reddii** (Scott) Bayer, **comb. et syn. nov.**: *H. cymbiformis* var. *reddii* (Scott) Bayer (1999): *H. reddii* Scott in Cact. Succ. J. (US) 66:182 (1994). Type: Cathcart, Waterdown Dam, *Scott 8968* (PRE). **H. boloensis* **H. fatreddii*

H. marumiana var. **viridis** Bayer in Haw. Revis.: 107 (1999). Type: S Prince Albert, *Bayer 3620* (NBG). **H. viridis*

H. mirabilis (Haw.) Haw. in Syn. Pl. Succ.: 95 (1812): *Aloe mirabilis* Haw. (1804). Neotype, designated by Bayer (1977): Illustration in Curtis' Bot. Mag.: t. 1354 (1811). Epitype, designated by Breuer & Metzinger (1997): Skuitsberg, between Caledon and Greyton, *Bayer 2453* (NBG).

H. mirabilis var. **mirabilis**

H. mirabilis var. **atrofusca** (Smith) Bayer, **comb. et syn. nov.**: *H. atrofusca* Smith in Jl. S. Afr. Bot. 14:41 (1948): *H. magnifica* var. *atrofusca* (Smith) Bayer (1977). Type: *Dekenah 225 sub Smith 6169* (NBG).

= *H. enigma* M.Hayashi in *Haworthia Study* 7: 14 (2002), **syn. nov.**

H. mirabilis var. **badia** (V.Poelln.) Bayer in Haw. Revis.: 109 (1999): *H. badia* V.Poelln. (1938): *Haworthia mirabilis* subsp. *badia* (V.Poelln.) Bayer (1976). Lectotype, designated by Bayer (1977): Illustration in *Kakteenk. en Kakteenfr.*: 76 (1938).

H. mirabilis var. **beukmannii** (V.Poelln.) Bayer in Haw. Revis.: 110 (1999): *H. emelyae* var. *beukmannii* V.Poelln. (1940): *H. beukmannii* (V.Poelln.) M.Hayashi (2000). Type: [unpublished image] (B). Epitype, designated by Bayer (1999): Caledon, Skuitsberg, *Smith 3969* (NBG).

H. mirabilis var. **consanguinea** Bayer in Haw. Revis.: 111 (1999): *H. consanguinea* (Bayer) M.Hayashi (2000). Type: Die Galg, *Bayer* (NBG).

H. mirabilis var. **heidelbergensis** (Smith) Bayer, **comb. et syn. nov.**: *H. heidelbergensis* Smith in Jl. S. Afr. Bot. 14:42 (1948). Type: W Heidelberg, *J. Dekenah 230 in Smith 6566* (NBG). **H. obscura?*

H. mirabilis var. **magnifica** (V.Poelln.) Bayer, **comb. et syn. nov.**: *Haworthia magnifica* V.Poelln. in *Repert. Spec. Nov. Regni Veg.* 33: 240 (1933): *H. maraisii* var. *magnifica* (V.Poelln.) Bayer : 131 (1976). Lectotype, designated by Breuer & Metzinger (1997): Riversdale, *Ferguson* (BOL). **H. vernalis*

H. mirabilis var. **maraisii** (V.Poelln.) Bayer, **comb. et syn. nov.**: *Haworthia maraisii* V.Poelln. in *Feddes Repert.* 38:194 (1935): *H. magnifica* var. *maraisii* (V.Poelln.) Bayer (1977). Type (icono.): Swellendam, *Marais in Swellendam 6410* (B).

= *H. schuldtiana* V.Poelln. (1937). *H. schuldtiana* var. *robertsonensis* V.Poelln. (1940). *H. schuldtiana* var. *minor* Triebn. et V.Poelln. (1940). *H. schuldtiana* var. *subtuberculata* V.Poelln. (1940). *H. whitesloaneana* V.Poelln. (1937): *H. schuldtiana* var. *whitesloaneana* (V.Poelln.) V.Poelln. (1940). *H. schuldtiana* var. *sublaevis* V.Poelln. (1940). *H. schuldtiana* var. *simplicior* V.Poelln. (1940). *H. schuldtiana* var. *unilineata* V.Poelln. (1940). *H. sublimpidula* V.Poelln. (1936). *H. triebneriana* var. *diversicolor* Triebn. et V.Poelln. (1939). *H. angustifolia* var. *subfalcata* V.Poelln. (1951), nom. inval. **H. calliantha*

H. mirabilis var. **meiringii** (Bayer) Bayer, **comb. et syn. nov.**: *H. maraisii* var. *meiringii* Bayer in *Haw. Hand.*:134 (1976): *H. magnifica* var. *meiringii* (Bayer) Bayer (1977). Type: E of

Bonnievale, *Bayer in KG 224/70* (NBG). **H. meiringii*
H. mirabilis var. **mundula** (Smith) Bayer, stat. nov.: *H. mundula* Smith in S. Afr. J. Bot. 12: 8 (1946): *H. mirabilis* subsp. *mundula* (Smith) Bayer (1976). Type: on Elim road, *Smith 5479* (NBG).
H. mirabilis var. **notabilis** (V.Poelln.) Bayer, **comb. et syn. nov.**: *H. notabilis* V.Poelln. in Repert. Spec. Nov. Regni. Veg. 44: 134 (1938): *H. maraisii* var. *notabilis* (V.Poelln.) Bayer (1976): *H. magnifica* var. *notabilis* Bayer (1977). Lectotype, designated by Breuer & Metzger (1997): [unpublished image] (B).
= *H. intermedia* V.Poelln. in Kakteenk. 9: 133 (1937), **syn. nov.**: *H. maculata* var. *intermedia* (V.Poelln.) Bayer (1999). *H. schuldtiana* var. *erecta* Triebn. & V.Poelln. (1940). *H. nitidula* var. *opaca* V.Poelln., nom. nud. (1948).
H. mirabilis var. **paradoxa** (V.Poelln.) Bayer in Haw. Revis.: 112 (1999): *H. paradoxa* V.Poelln. (1933): *H. maraisii* var. *paradoxa* (V.Poelln.) Bayer (1976): *H. magnifica* var. *paradoxa* (V.Poelln.) Bayer (1977). Neotype, designated by Breuer & Metzger (1997): Riversdale, *Ferguson s.n.* (BOL).
= *H. jakubii* Breuer in *Alsterworthia Int. Sp. Is.* 7: 10 (2004), **syn. nov.** **H. bobii*
H. mirabilis var. **scabra** (Bayer) Bayer, **comb. et syn. nov.**: *H. heidelbergensis* var. *scabra* Bayer in Haw. Revis.: 82 (1999): *H. scabrida* Breuer (2010). Type: Drew, Leeurivier, *Bayer 1700* (NBG).
H. mirabilis var. **splendens** (Hammer & Venter) Bayer, **comb. et syn. nov.**: *H. magnifica* var. *splendens* Hammer and Venter in *Cact. Succ. J. (US)* 70: 180 (1998): *H. splendens* (Hammer & Venter) M.Hayashi (2000). Type: W Albertinia, *Venter* (NBG).
H. mirabilis var. **sublineata** (V.Poelln.) Bayer in Haw. Revis.: 113 (1999): *H. triebneriana* var. *sublineata* V.Poelln. (1938): *H. sublineata* (V.Poelln.) Breuer (2010). Neotype, designated by Bayer (1999): S Bredasdorp, *Smith 3966* (NBG).
H. mirabilis var. **toonensis** (Bayer) Bayer, **comb. et syn. nov.**: *H. heidelbergensis* var. *toonensis* Bayer in Haw. Revis.: 83 (1999): *H. toonensis* (Bayer) Breuer (2010). Type: Heidelberg, Matjestoon, *Smith 6797* (NBG).
H. mirabilis var. **triebneriana** (V.Poelln.) Bayer in Haw. Revis.: 113 (1999): *H. triebneriana* V.Poelln. (1936). Lectotype, designated by Bayer (1999): [unpublished illustration] (B).
= *H. willowmorensis* V.Poelln. (1937). *H. triebneriana* var. *depauperata* V.Poelln. (1938): *H. depauperata* (V.Poelln.) Breuer (2010). *H. triebneriana* var. *multituberculata* V.Poelln. (1938). *H. triebneriana* var. *rubrodentata* Triebn. et V.Poelln. (1939). *H. triebneriana* var. *napiensis* Triebn. et V.Poelln. (1939). *H. triebneriana* var. *turgida* Triebn. (1939). *H. triebneriana* var. *subtuberculata* V.Poelln. (1939). *H. triebneriana* var. *pulchra* V.Poelln. (1940). *H. rossouwii* V.Poelln. (1938). *H. nitidula* V.Poelln. (1939). *H. triebneriana* var. *diversicolor* Triebner & V.Poelln. in *Feddes Repert.* 47: 9 (1939), **syn. nov.**: *H. diversicolor* (Triebner & V.Poelln.) M.Hayashi (2010).

H. monticola Fourcade in *Trans. Roy. Soc. S. Africa* 21:78 (1937). Type: George and Uniondale districts, *Fourcade 2498* (K).

= *H. divergens* Bayer (1976).

H. monticola var. **monticola**

= *H. bronkhorstii* M.Hayashi in *Haworthiad* 15: 16 (2001), **syn. nov.** **H. baviens* **H. glabella*

H. monticola var. **asema** Bayer in Haw. Revis.: 117 (1999): *H. asema* (Bayer) M.Hayashi (2000). Type: Calitzdorp, Besemkop, *Venter 12* (NBG).

H. mucronata Haw. in *Suppl. Pl. Succ.*: 50 (1819). Lectotype, designated by Bayer (1999): [unpublished illustration] (K).

= *H. unicolor* V.Poelln. (1937): *H. unicolor* var. *unicolor* (V.Poelln.) Bayer (1982). *H. mclarenii* V.Poelln. (1939). *H. tradouwensis* Breuer in Avonia 21: 57 (2003), **syn. nov.** **H. armata* **H. confluens* **H. montagua*

H. mucronata var. **mucronata**

H. mucronata var. **habdomadis** (V.Poelln.) Bayer in Haw. Revis.: 120 (1999): *H. habdomadis* V.Poelln. (1938): *H. inconfluens* var. *habdomadis* (V.Poelln.) Bayer (1976). Neotype, designated by Breuer & Metzger (1997): Seweweekspoort, *Barker & Lewis s.n NBG2764/32* (BOL).

H. mucronata var. **inconfluens** (V.Poelln.) Bayer in Haw. Revis.: 121 (1999): *H. altilinea* var. *limpida* f. *inconfluens* V.Poelln. (1938): *H. mucronata* var. *limpida* f. *inconfluens* (V.Poelln.) V.Poelln. (1940): *H. inconfluens* (V.Poelln.) Bayer (1976): *H. habdomadis* var. *inconfluens* (V.Poelln.) Bayer (1977). Lectotype, designated by Breuer & Metzger (1997): [unpublished image] *Triebner 1031* (B).

= *H. bijliana* var. *joubertii* V.Poelln. (1936). *H. setata* var. *bijliana* sv. *joubertii* (V.Poelln.) V.Poelln. (1938): *H. setata* var. *joubertii* (V.Poelln.) Jacobsen (1960). *H. integra* var. *standeri* Esterhuizen in Haworthiad 14: 21 (2000), **syn. nov.**: *H. standeri* (Esterhuizen) M.Hayashi (2010). *H. crystallina* M.Hayashi in Haworthia Study 15: 116 (2006), **syn. nov.** **H. allomadis* **H. calitzensis* **H. rooibergensis* **H. horrida* **H. kotei*

H. mucronata var. **rycroftiana** Bayer in Haw. Hand.: 54 (1976). Gouritz River between Vanwyksdorp and Herbertsdale, *Bayer 1701* (NBG).

= *H. integra* V.Poelln. in Feddes Repert. 33: 239 (1933), **syn. nov.**

H. mucronata var. **morrisiae** (V.Poelln.) V.Poelln. in Feddes Repert. 49: 29 (1940): *H. altilinea* var. *morrisiae* V.Poelln. (1938): *H. inconfluens* var. *morrisiae* (V.Poelln.) Bayer (1976): *H. habdomadis* var. *morrisiae* (V.Poelln.) Bayer (1977). Lectotype, designated by Breuer & Metzger (1997): [unpublished image] (B).

= *H. sakai* M.Hayashi in Haworthia Study 3: 13 (2000), **syn. nov.**

H. mutica Haw. in Revis.:55 (1821). Lectotype, designated by Bayer (1978): [image] (K; later published in *Excelsa* 8: 50 (1978). Epitype, designated by Breuer & Metzger (1997): NE Soetrivier Bridge, *Bayer KG623/69* (NBG).

= *H. otzenii* Smith (1945). *H. groenewaldii* Breuer in *Alsterworthia* Int. 11: 15 (2011), **syn. nov.**

H. nortieri Smith in *Jl. S. Afr. Bot.* 12: 13 (1946). Type: Vanrhynsdorp, *Smith 1676a* (NBG).

= *H. nortieri* var. *montana* Smith (1950). *H. nortieri* var. *giftbergensis* Smith (1950): *H. giftbergensis* (Smith) Breuer (2010). *H. agnis* Battista in *Alsterworthia* Int. 2: 9 (2002), **syn. nov.** *H. montana* M.Hayashi in *Haworthia* Study 14: 14 (2005), **nom. inval.**

H. nortieri var. **nortieri**

H. nortieri var. **albispina** (M.Hayashi) Bayer, **comb. et stat. nov.**: *H. albispina* M.Hayashi in *Haworthia* Study 8: 1 (2002). Type: E Laingsburg, *Hayashi 02-48* (TUAT).

H. nortieri var. **devriesii** (Breuer) Bayer, **comb. et stat. nov.**: *H. devriesii* Breuer in *Avonia* 21: 47 (2003). Type: Prince Albert, *Breuer 6930* (TUAT).

H. nortieri var. **globosiflora** (Smith) Bayer (1976): *H. globosiflora* Smith (1950). Type: Doornbosch, N Doorn River Bridge, *Smith 7198* (NBG).

H. nortieri var. **pehlemanniae** (Scott) Bayer in Haw. Revis.: 129 (1999): *H. pehlemanniae* Scott (1982). Type: W Laingsburg, *Scott 7450* (PRE).

H. outeniquensis Bayer in Haw. Revis.: 130 (1999). Type: Moerasriver, *Venter 94/61* (NBG). **H. heroldia*

H. parksiana V.Poelln. in *Cactus J.* 5: 34 (1936). Lectotype, designated by Breuer & Metzger

(1997): [image, later published in Desert Pl. Life 10: 48 (1938)] (B).

H. pubescens Bayer in J. S. Afr. Bot. 38: 129 (1973). Type: Worcester, Sandberg Hills, *Bayer 163* (NBG).

H. pubescens var. **pubescens**

H. pubescens var. **livida** Bayer in Haw. Revis.: 134 (1999). Type: Worcester, Lemoenpoort, *Bayer 1128* (NBG). **H. livida*

H. pulchella Bayer in J. S. Afr. Bot. 39: 232 (1973). Type: Touws River, Avondrust, *Bayer 163* (NBG).

H. pulchella var. **pulchella**

H. pulchella var. **globifera** Bayer in Haw. Revis.: 136 (1999): *H. globifera* (Bayer) M.Hayashi (2000). Type: SE Anysberg, *Bruyns 7338* (NBG).

H. pygmaea V.Poelln. in Repert. Spec. Nov. Regni Veg. 27: 132 (1930). Neotype, designated by Breuer & Metzger (1997): hills E Great Brak, *Fourcade 4759* (BOL).

= *H. esterhuizenii* M.Hayashi in Haworthia Study 7: 14 (2002), **syn. nov.** **H. asperata*

H. pygmaea var. **pygmaea**

H. pygmaea var. **acuminata** (Bayer) Bayer, **comb. et syn. nov.**: *H. retusa* f. *acuminata* Bayer in Haw. Handb.: 53 (1976): *H. retusa* var. *acuminata* (Bayer) Bayer (1982): *H. magnifica* var. *acuminata* (Bayer) Bayer (1999). Type: N of Gouritzmond, *Bayer in KG 311/7* (NBG). **H. acuminata*.

H. pygmaea var. **argenteo-maculosa** (Smith) Bayer in Haw. Revis.: 138 (1999): *H. dekenahii* var. *argenteo-maculosa* Smith (1945): *H. retusa* f. *argenteo-maculosa* (Smith) Bayer (1976).

Type: between Gouritz Bridge and Mossel Bay, *Emett s.n. NBG68037* (NBG).

= *H. silviae* M.Hayashi in Haworthia Study 3: 13 (2000), **syn. nov.**

H. pygmaea var. **dekenahii** (Smith) Bayer, **comb. et syn. nov.**: *H. dekenahii* Smith in J. S. Afr. Bot. 10: 140 (1944): *H. retusa* var. *dekenahii* (Smith) Bayer (1982): *H. magnifica* var. *dekenahii* (Smith) Bayer (1999). Type: Farm Draaihoek, *J. Dekenah 86 sub Smith 5489* (NBG).

H. pygmaea var. **fusca** (Breuer) Bayer, **stat. et syn. nov.**: *H. fusca* Breuer in Alsterworthia Int. Special Issue 7: 9 (2004). Type: W Albertinia, *Breuer 8971* (GRA).

H. pygmaea var. **vincentii** (Breuer) Bayer, **stat. et syn. nov.**: *H. vincentii* Breuer in Alsterworthia Int. Special Issue 7: 11 (2004). Type: NE Albertinia, *De Vries 071* (GRA).

H. reticulata (Haw.) Haw. in Syn. Pl. Succ.: 94 (1812): *Aloe reticulata* Haw. (1804). Neotype, designated by Bayer (1972): Illustration in Curtis' Bot.Mag.: t. 1314 (1811). Epitype, designated by Breuer & Metzger (1997): SW Worcester, Ribokkop, *Bayer 160* (NBG).

= *Aloe pumilio* Jacq. (1804). *H. reticulata* var. *acuminata* (1938). *H. hurlingii* var. *ambigua* Triebn. & V.Poelln. (1938). *H. guttata* Uitew. (1947). *H. intermedia* V.Poelln. (1937), **syn. nov.**: *H. magnifica* var. *intermedia* (V.Poelln.) Bayer (1999).

H. reticulata var. **reticulata**

H. reticulata var. **attenuata** Bayer in Haw. Revis.: 140 (1999). Type: S Bonnievale, *Smith 3979* (NBG). **H. oxygona*?

H. reticulata var. **hurlingii** (V.Poelln.) Bayer in New. Haw. Handb.: 52 (1982): *H. hurlingii* V.Poelln. (1936). Lectotype, designated by Breuer & Metzger (1997): [image, later published in Desert Pl. Life 10: 125 (1938)] (B).

H. reticulata var. **subregularis** (Baker) Bayer in Haw. Revis.: 141 (1999): *H. subregularis* Baker (1870). Lectotype, designated by Bayer (1999): Illustration in Saund. Ref. Bot.: t. 232 (1870).

= *H. haageana* V.Poelln. (1930). *H. haageana* var. *subreticulata* V.Poelln. (1937).

H. retusa (L.) Duval in Pl. Succ. Hort. Alenc.: 7 (1809): *Aloe retusa* L. (1753). Lectotype, designated by Scott (1985): Illustration in Commelin, Horti Med. Amstelod. 2: t. 6 (1701). Epitype, designated by Breuer & Metzinger (1997): Blikbonnie, E Riversdale, *Dekenah s.n.* NBG144772 (NBG).

= *H. foucheii* V.Poelln. (1940). *H. retusa* var. *multilineata* Smith (1946): *H. multilineata* (Smith) Scott (1985). *H. retusa* var. *solitaria* Smith (1946): *H. solitaria* (Smith) Scott (1973). *H. retusa* var. *densiflora* Smith (1946). *H. geraldii* Scott (1965). **H. subretusa*

H. retusa var. **retusa**

H. retusa var. **longibracteata** (Smith) Bayer, **comb. et syn. nov.**: *H. longibracteata* Smith in Jl. S. Afr. Bot. 11: 75 (1945): *H. turgida* var. *longibracteata* (Smith) Bayer (1999). Type: near Stilbaai, *Dekenah 18 sub Smith 5378* (NBG).

H. retusa var. **nigra** (Bayer) Bayer, **comb. et syn. nov.**: *H. mutica* var. *nigra* Bayer in Haw. Revis.: 126 (1999). Type: Kransriviermond, *Smith 5753* (NBG). **H. quimutica* **H. chromutica*

H. retusa var. **suberecta** (V.Poelln.) Bayer, **comb. et syn. nov.**: *H. turgida* var. *suberecta* V.Poelln. in Repert. Spec. Nov. Regni Veg. 44: 134 (1938): *H. suberecta* (V.Poelln.) Breuer (2010). Neotype, designated by Bayer (1999): Brandwacht, *Bayer s.n. KG631/69* (NBG).

= *H. turgida* var. *subtuberculata* V.Poelln. (1938). *H. turgida* var. *pallidifolia* Smith (1946): *H. pallidifolia* (Smith) Breuer (2010). **H. rodinii*

H. retusa var. **turgida** (Haw) Bayer, **comb. et syn. nov.**: *H. turgida* Haw. in Suppl. Pl. Succ.: 52 (1819). Neotype, designated by Breuer & Metzinger (1997): Swellendam, Breede River Bridge, *Bayer 2420* (NBG).

= *H. laetivirens* Haw. (1819). *H. caespitosa* V.Poelln. (1936). *H. caespitosa* f. *subplana* V.Poelln. (1938). *H. caespitosa* f. *subproliferans* V.Poelln. **H. pseudo* **H. reflexa*

H. rossouwii V.Poelln. in Kakteenk. 7: 75 (1938). Lectotype, designated here: [unpublished image] (B).

= *H. serrata* Bayer in Jl. S. Afr. Bot. 39: 249 (1973), **syn. nov.** Type: Heidelberg, Oudekraalkop, *Bayer 166* (NBG).

H. rossouwii var. **rossouwii**

H. rossouwii var. **calcareae** (Bayer) Bayer, **comb. et syn. nov.**: *H. mirabilis* var. *calcareae* Bayer in Haw. Revis.: 110 (1999): *H. calcareae* (Bayer) M.Hayashi (2000). Type: Bredasdorp, De Hoop, *Burgers 1648* (NBG).

H. rossouwii var. **minor** (Bayer) Bayer, **comb. et syn. nov.**: *H. heidelbergensis* var. *minor* Bayer in Haw. Revis.: 82 (1999): *H. rooivleiensis* Breuer (2010). Type: Bredasdorp, Rooivlei, *Bayer sub KG 36/70* (NBG).

H. rossouwii var. **petrophila** (Bayer) Bayer, **comb. et syn. nov.**: *H. variegata* var. *petrophila* Bayer in Haw. Revis.: 159 (1999): *H. petrophila* (Bayer) M.Hayashi (2000). Type: Renosterfontein, *Burgers 2158* (NBG).

H. rossouwii var. **elizeae** (Breuer) Bayer in Haworthia Update 2.2: 153 (2006): *H. elizeae* Breuer (2003). Type: W Swellendam, *Breuer 6936* (TUAT).

H. semiviva (V.Poelln.) Bayer in Haw. Handb.: 153 (1976): *H. bolusii* var. *semiviva* V.Poelln. (1938). Lectotype, designated by Breuer & Metzinger (1997): [image, later published in Succulenta (Netherlands) 22: 25 (1940)] (B). **H. sphaeroidea* **H. victoria*

H. springbokvlakensis Scott in Jl. S. Afr. Bot. 36: 287 (1970). Type: Springbokvlakte, *Scott 245* (PRE).

H. transiens (V.Poelln) Bayer in Haworthiad 16: 66 (2002): *H. cymbiformis* var. *transiens* (V.Poelln.) Bayer (1976): *H. planifolia* var. *transiens* V.Poelln. (1938). Lectotype, designated by Breuer & Metzinger (1997): [unpublished image] (B).

= *H. cymbiformis* var. *translucens* Triebn. et V.Poelln. (1938). *H. cymbiformis* var. *multifolia* Triebn. (1938). *H. cymbiformis* var. *brevifolia* Triebn. et V.Poelln. (1938). **H. klipensis*

H. truncata Schonland in Trans. Roy. Soc. S. Afr. 1: 391 (1910). Type: near Oudtshoorn, Britten (K).

= *H. truncata* f. *tenuis* V.Poelln. (1938): *H. truncata* var. *tenuis* (V.Poelln.) Bayer (1976). *H. truncata* f. *crassa* V.Poelln. (1938). *H. truncata* f. *normalis* V.Poelln. (1938). *H. truncata* var. *minor* Breuer in Avonia 21: 59 (2003), **syn. nov.:** *H. papillaris* Breuer (2010).

H. truncata var. **truncata**

H. truncata var. **maughanii** (V.Poelln.) Bayer in Haw. Revis.: 151 (1999). *H. maughanii* V.Poelln. (1932). Neotype, designated by Breuer & Metzinger (1997): Calitzdorp, *Malherbe s.n.* NBG307/40 (NBG).

H. variegata Bolus in J. Bot. Soc. S. Afr.: 137 (1929). Type: Botterkloof, *Mrs. E. Ferguson s.n.* BOL18900 (BOL).

H. variegata var. **variegata**

H. variegata var. **hemicrypta** Bayer in Haw. Revis.: 158 (1999): *H. hemicrypta* (Bayer) M.Hayashi (2000). Type: NE lower slopes of Potberg, *Burgers 2582* (NBG).

H. variegata var. **modesta** Bayer in Haw. Revis.: 159 (1999): *H. modesta* (Bayer) Hayashi (2000). Type: SW Kathoek, *Bayer 2551* (NBG).

H. vlokii Bayer in Haw. Revis.: 160 (1999). Type: Swartberg Mts., *Vlok sub Venter 91/2* (NBG).

H. wittebergensis Barker in J. S. Afr. Bot. 8: 245 (1942). Type : Witteberg, *Pieterse sub NBG 68214* (NBG).

H. zantneriana V.Poelln. in Cactus J. 5: 35 (1936). Lectotype, designated by Breuer & Metzinger (1997): [image, later published in Desert Pl. Life 9: 90 (1937)] (B).

H. zantneriana var. **zantneriana**

H. zantneriana var. **minor** Bayer in Haw. Revis.: 164 (1999): *H. inspida* Breuer (2010). Type: near Miller Station, *Bayer 1702* (NBG).

II. Subgenus Hexangulares (Uitewaal) M.B.Bayer [as Uitewaal ex M.B.Bayer] in Haw. Handb.: 14 (1976). Type species: *Haworthia coarctata* Haw. [Lectotype, designated by Bayer (1976)]. ± 15 spp.

H. attenuata (Haw.) Haw. in Syn. Pl. Succ.: 92 (1812): *Aloe attenuata* Haw. (1804). Neotype, designated by Breuer & Metzinger (1997): 20 km E Patensie, Sandland. *Perry 660* (NBG).

= *H. clariperla* Haw. (1928): *Aloe attenuata* var. *clariperla* (Haw) Salm-Dyck (1834): *H. attenuata* var. *clariperla* (Haw.) Baker (1880): *H. attenuata* f. *clariperla* (Haw.) Bayer (1976). *H. fasciata* var. *caespitosa* Berger (1908). *H. britteniana* V.Poelln. (1937): *H. attenuata* var. *britteniana* (V.Poelln.) V.Poelln. (1937): *H. attenuata* f. *britteniana* [as *britteniae*] (V.Poelln.) Bayer (1976). *H. attenuata* var. *odonoghueana* et vars. *linearis*, *uitewaaliana*, *deltoidea*, *minissima*, *inuitata* Farden (1939).

H. attenuata var. **attenuata**

H. attenuata var. **glabrata** (Salm Dyck) Bayer, **comb. et stat. nov.**: *Aloe glabrata* Salm Dyck in Hort.Dyck.: 325 (1834): *H. glabrata* (Salm Dyck) Baker (1880). Neotype, designated by Smith & Greyling (1990): Illustration in Salm Dyck, Aloes Mesembr. 3: *Aloe* t. 7 [sect. 6: 13] (1840). *H. attenuata* var. **radula** (Jacq.) Bayer in Haw. Revis.: 167 (1999): *Aloe radula* Jacq. (1804): *H. radula* (Jacq.) Haw. (1812). Type: Illustration in Jacq., Pl. Hort.Schoenbr. 4: t. 422 (1804). Epitype, designated by Breuer & Metzinger (1997): 1.6 km from Hankey to Thornhill, *Smith 3190* (NBG).

H. bruynsii Bayer in J. S. Afr. Bot. 47:789 (1981). Type: SE Steytlerville, *Rossouw 456* (NBG).

H. coarctata Haw. in Philos.Mag. 64: 301 (1824). Neotype, designated by Breyer & Metzinger (1997): 16 km from Grahamstown to Bathurst, *Smith 7092* (NBG).
= *H. chalwinii* Marl.et Berg. (1906). *H. reinwardtii* var. *conspicua* V.Poelln. (1937). *H. fallax* V.Poelln. (1932): *H. reinwardtii* var. *fallax* V.Poelln. (1937). *H. reinwardtii* var. *pseudocoarctata* V.Poelln. (1940): *H. coarctata* var. *haworthii* f. *pseudocoarctata* (V.Poelln.) Resende (1943). *H. coarctata* var. *haworthii* Resende (1943). *H. coarctata* var. *kraussii* Resende (1943). *H. reinwardtii* var. *committeesensis* Smith (1943). *H. reinwardtii* var. *huntsdriftensis* Smith (1944). *H. fulva* Smith (1943). *H. musculina* Smith (1948). *H. greenii* var. *silvicola* Smith (1943).

H. coarctata var. **coarctata**

H. coarctata var. *coarctata* f. **coarctata**

H. coarctata var. *coarctata* f. **greenii** (Baker) Bayer in Haw. Revis.: 172 (1999): *H. greenii* Baker (1880): *H. greenii* subsp. *coarctata* var. *greenii* (Baker) Bayer (1973). Type: Cape, *Cooper 1860* (K).

= *H. peacockii* Baker (1880). *H. greenii* f. *bakeri* Resende (1943). *H. greenii* f. *minor* Resende (1943).

H. coarctata var. **adelaidensis** (V.Poelln.) Bayer in Haw. Revis.: 172 (1999): *H. reinwardtii* var. *adelaidensis* V.Poelln. (1940): *H. coarctata* subsp. *adelaidensis* (V.Poelln.) Bayer (1973): *H. adelaidensis* (V.Poelln.) Breuer in Gen. Haw. 1: 7 (2010). Lectotype, designated by Breuer & Metzinger (1997): [unpublished image] (B).

= *H. reinwardtii* var. *riebeekensis* Smith (1944). *H. reinwardtii* var. *bellula* Smith (1945).

H. coarctata var. **tenuis** (Smith) Bayer in Haw. Revis.: 173 (1999): *H. reinwardtii* var. *tenuis* Smith (1948): *H. coarctata* ssp. *coarctata* var. *tenuis* (Smith) Bayer (1973): *H. tenuis* (Smith) Breuer (2010). Type: Cape, Alexandria Dist. *Smith 3420* (NBG).

H. fasciata (Willd.) Haw. in Suppl. Pl. Succ.: 57 (1819): *Apicra fasciata* Willd. (1811): *Aloe fasciata* (Willd.) Salm Dyck (1937). Neotype, designated by Breuer & Metzinger (1997): Hankey, *Stayner s.n. NBG110360* (NBG).

= *H. fasciata* var. *major* Haw. (1819). *Aloe fasciata* var. *major* Salm Dyck (1837): *H. fasciata* var. *major* (Salm Dyck) V.Poelln. (1938). *H. fasciata* var. *subconfluens* V.Poelln. (1937): *H. fasciata* f. *subconfluens* (V.Poelln.) V.Poelln. (1938). *H. fasciata* f. *ovatolanceolata* V.Poelln. (1938). *H. fasciata* f. *sparsa* V.Poelln. (1938). *H. fasciata* f. *variabilis* V.Poelln. (1938). *H. fasciata* f. *vanstaadenensis* V.Poelln. (1938). *H. browniana* V.Poelln. (1937): *H. fasciata* f. *browniana* (V.Poelln.) Bayer (1976).

H. glauca Baker in J. Linn. Soc. Bot. 18:203 (1880). Type: Zuurberg Pass, *Cooper* (K).

= *H. carrissoi* Resende (1941).

H. glauca var. **glauca**

H. glauca var. **herrei** (V.Poelln.) Bayer in Haw. Hand.: 122 (1976): *H. herrei* V. Poelln. (1929).

Neotype, designated by Breuer & Metzging (1997): Campherspoort, *Barker 5069* (NBG).
= *H. herrei* var. *depauperata* V.Poelln. (1932). *H. jacobseniana* V.Poelln. (1937). *H. eilyae*
V.Poelln. (1937). *H. jonesiae* V.Poelln. (1937). *H. herrei* var. *poellnitzii* Resende (1943). *H.*
eilyae var. *poellnitziana* Resende (1943). *H. eilyae* var. *zantneriana* Resende (1943). *H.*
armstrongii V.Poelln. (1937); *H. glauca* var. *herrei* f. *armstrongii* (V.Poelln.) Bayer (1976).

H. granulata Marloth in Trans. Ror. Soc. S. Afr. 2:39 (1910): *H. venosa* subsp. *granulata*
(Marloth) Bayer (1976). Type: Verlatenkloof, *Marloth 4217* (BOL).
= *H. schoemaniai* M.Hayashi in *Haworthia Study* 9: 14 (2003), **syn. nov.**

H. koelmaniorum Oberm. & Hardy in Fl. Pl. Africa :f. 1502 (1967). Type: Groblersdal, *Hardy*
& *Mauve 2267* (PRE).

H. koelmaniorum var. **koelmaniorum**

H. koelmaniorum var. **mcmurtryi** (Scott) Bayer in *Haw. Revis.*: 181 (1999): *Haworthia*
mcmurtryi Scott (1984). Type: Loskop, SW Dam, *McMurtry 5247* (PRE).

H. limifolia Marloth in Trans. Roy. Soc. S. Africa 1: 409 (1908). Type: W Delagoa Bay,
Marloth 4678 (PRE).

= *H. limifolia* var. *diploidea* Resende (1940). *H. limifolia* var. *tetraploidea* Resende (1940). *H.*
limifolia f. *marlothiana* Resende (1941); *H. limifolia* var. *marlothiana* (Resende) Resende
(1943). *H. limifolia* var. *schuldtiana* Resende (1940). *H. limifolia* var. *stolonifera* Resende
(1940). *H. limifolia* var. *stolonifera* f. *pimentelli* Resende (1943). *H. limifolia* var. *stolonifera* f.
major Resende (1943). *H. limifolia* var. *keithii* Smith (1950). **H. gideonii*

H. limifolia var. **limifolia**

H. limifolia var. **arcana** G.F.Smith & N.R.Crouch in *Bradleya* 19: 119 (2001): *H. arcana*
(G.F.Smith & N.R.Crouch) Breuer in *Gen. Haw.* 1: 7 (2010). Type: Republic of South Africa,
Mpumalanga Province, 2531 (Komatipoort): near Hectorspruit, (-BC), *N.R. Crouch & G.F.*
Smith 7 (holo-, PRE).”

H. limifolia var. **gigantea** Bayer in *Jl. S. Afr. Bot.* 28: 215 (1962): *H. gigantea* (Bayer)
M.Hayashi (2000). Type: Nongoma, *Bayer 112* (PRE).

H. limifolia var. **glaucophylla** Bayer in *Haworthia Update* 2: 1 (2006): *H. glaucophylla* (Bayer)
Breuer (2010). Type: Mpumalanga, Three Sisters, *F. Venter 13700* (NBG).

H. limifolia var. **ubomboensis** (Verdoorn) Smith in *Jl. S. Afr. Bot.* 16: 3 (1950): *H. ubomboensis*
Verdoorn (1941). Type: 16km S Stegi, *Keith s.n. PRE26392* (PRE).

H. longiana V.Poelln. in *Feddes Repert.* 41: 203 (1937). Neotype, designated by Breuer &
Metzging (1997): [unpublished image] (B).
= *H. longiana* var. *albinota* Smith (1948).

H. nigra (Haw.) Baker in *J. Linn. Soc. Bot.* 18: 203 (1880): *Apicra nigra* Haw. (1825). Neotype,
designated by Breuer & Metzging (1997): Campherspoort, *Barker 5099* (NBG).

= *H. schmidtiana* V.Poelln. (1929): *H. nigra* var. *schmidtiana* (V.Poelln.) Uitew. (1948). *H.*
schmidtiana var. *angustata* V.Poelln. (1937): *H. nigra* var. *angustata* (V.Poelln.) Uitew. (1948).
H. schmidtiana var. *suberecta* V.Poelln. (1937): *H. nigra* var. *suberecta* (V.Poelln.) Uitew.
(1948). *H. schmidtiana* var. *pusilla* V.Poelln. (1938): *H. nigra* var. *pusilla* (V.Poelln.) Uitew.
(1948). *H. ryneveldii* V.Poelln. (1939). **H. eonigra*

H. nigra var. **nigra**

H. nigra var. **diversifolia** (V.Poelln.) Uitew. in *Succulenta*: 51 (1948): *H. diversifolia* V.Poelln.

(1937): *H. schmidtiana* var. *diversifolia* (V.Poelln.) V.Poelln. (1938). Neotype, designated by Bayer (1999): Kruidfontein, *Bruyns in KG435/75* (NBG).

= *H. schmidtiana* var. *diversifolia* f. *nana* V.Poelln. (1938): *H. nigra* var. *diversifolia* f. *nana* (V.Poelln.) Uitew. (1948).

H. nigra var. **elongata** (V.Poelln.) Uitew. in *Succulenta*: 51 (1948): *H. schmidtiana* var. *elongata* V.Poelln. (1938). Neotype, designated here: Slagtersnek, *Van Jaarsveld & Marthinus 7913* (NBG).

H. pungens Bayer in *Haw. Revis.*:188 (1999). Type: Braamriver. *Bruyns 7090* (NBG).

H. reinwardtii (Salm Dyck) Haw. in *Saxifrag. Enum.* 2: 53 (1821): *Aloe reinwardtii* Salm Dyck (1821). Neotype, designated by Scott (1981): Illustration in Salm Dyck, *Aloes Mesembr.* 1: *Aloe* t. 12 [sect. 6: 16] (1836). Epitype, designated by Breuer & Metzinger (1997): hill above Ncera River Bridge, *Smith 3563* (NBG).

= *H. reinwardtii* var. *major* Baker (1880). *H. reinwardtii* var. *pulchra* V.Poelln. (1937). *H. reinwardtii* var. *archibaldiae* V.Poelln. (1937). *H. reinwardtii* var. *peddiensis* Smith (1943). *H. reinwardtii* var. *valida* Smith (1943). *H. reinwardtii* var. *grandicula* Smith (1944). *H. reinwardtii* var. *haworthii* Resende (1943). *H. reinwardtii* var. *triebneri* Resende (1943).

H. reinwardtii var. **reinwardtii**

H. reinwardtii f. **reinwardtii**

H. reinwardtii f. **chalumnensis** (Smith) Bayer (1976): *H. reinwardtii* var. *chalumnensis* Smith (1943). Type: Chalumna, *Smith 513* (NBG).

H. reinwardtii f. **kaffirdriftensis** (Smith) Bayer (1976): *H. reinwardtii* var. *kaffirdriftensis* Smith (1943). Type: Kaffirdrift, *Smith 3364* (NBG).

H. reinwardtii f. **olivacea** (Smith) Bayer (1976): *H. reinwardtii* var. *olivacea* Smith (1944): *H. olivacea* (Smith) Breuer (2010). Type: Kaffirdrift, *Smith 5260* (NBG).

H. reinwardtii f. **zebrina** (Smith) Bayer (1976): *H. reinwardtii* var. *zebrina* Smith (1944). Type: Kaffirdrift, *Smith 5258* (NBG).

H. reinwardtii var. **brevicula** Smith in *Jl. S. Afr. Bot.* 10: 11 (1944): *H. brevicula* (Smith) Breuer in *Gen. Haw.* 1: 7 (2010). Type: Frazers Camp, *Smith 3138* (NBG).

= *H. reinwardtii* var. *diminuta* Smith (1948).

H. scabra Haw. in *Suppl. Pl. Succ.*: 58 (1819). Lectotype, designated by Scott (1980): [illustration, later published in *Cact. Succ. J. (Los Angeles)* 52: 274 (1980)] (K).

= *H. tuberculata* V.Poelln. (1931). *H. tuberculata* var. *acuminata* V.Poelln. (1938). *H. tuberculata* var. *sublaevis* V.Poelln. (1938). *H. tuberculata* var. *subexpansa* V.Poelln. (1938). *H. tuberculata* var. *angustata* V.Poelln. (1940). *H. scabra* var. *johanii* M.Hayashi in *Haworthiad* 15: 16 (2001), **syn. nov.**: *H. johanii* (M.Hayashi) Breuer (2010).

H. scabra var. **scabra**

H. scabra var. **lateganiae** (V.Poelln.) Bayer in *Haw. Revis.*: 195 (1999): *H. starkiana* var. *lateganiae* (V.Poelln.) Bayer (1976): *H. lateganiae* V.Poelln. (1937). Lectotype, designated by Breuer & Metzinger (1997): [image, later published in *Desert Pl. Life* 9: 103 (1937): (B).

H. scabra var. **morrisiae** (V.Poelln.) Bayer in *Haw. Hand.*: 137 (1976): *H. morrisiae* V.Poelln. (1937). Lectotype, designated by Breuer & Metzinger (1997): [image, later published in *Kakteenk. & Kakteenfr.* 1937: 132 (1937)] (B). **H. plettens*

H. scabra var. **starkiana** (V.Poelln.) Bayer in *Haw. Revis.*: 197 (1999): *H. starkiana* V.Poelln. (1933). Lectotype, designated by Breuer & Metzinger (1997): [unpublished image] (B).

= *H. smitii* V.Poelln. (1938).

H. sordida Haw. in Revis.: 51 (1821): *Aloe sordida* Schult. & Schult.f. (1829). Neotype, designated by Scott (1985): Illustration in Salm Dyck, Aloes Mesembr. 7: *Aloe* t. 1 [sect 7: 2] (1863).

= *H. sordida* var. *agavoides* (Zant. & V.Poelln.) Smith (1950): *H. agavoides* Zant. & V.Poelln. (1938).

H. sordida var. **sordida**

H. sordida var. **lavranii** Scott in Cact. Succ. J. (US) 53: 70 (1981): *H. lavranii* (Scott) Breuer (2010). Type: Perdehoek, Little Karoo, *Hechter s.n. PRE61124* (PRE).

H. tessellata Haw. in Phil. Mag. 44: 300 (1824): . *Aloe tessellata* (Haw.) Schult. & Schult.f. (1829): *H. venosa* subsp. *tessellata* (Haw.) Bayer (1976). Lectotype, designated by Scott (1978): [illustration, later published in Cact. Succ. J. (Los Angeles) 50: 75 (1978) (K).

= *H. parva* Haw. (1824): *Aloe parva* (Haw.) Schult. & Schult.f. (1829): *H. tessellata* var. *parva* (Haw.) Baker (1880). *H. tessellata* var. *inflexa* Baker (1880). *H. engleri* Dint. (1914): *H. tessellata* var. *engleri* (Dint.) V.Poelln. (1938). *H. pseudotessellata* V.Poelln. (1929). *H. tessellata* var. *tuberculata* V.Poelln. (1936). *H. minutissima* V.Poelln. (1939): *H. tessellata* var. *minutissima* (V.Poelln.) Viveiros (194?). *H. tessellata* var. *elongata* Van Woerden (1940). *H. tessellata* var. *simplex* Resende & V.Poelln. (1942). *H. tessellata* var. *stepheneana* Resende & V.Poelln. (1942). *H. tessellata* var. *luisierii* Resende & V.Poelln. (1942). *H. tessellata* var. *pahinhiae* Resende & V.Poelln. (1942). *H. tessellata* var. *velutina* Resende & V.Poelln. (1942). *H. tessellata* var. *coriacea* Resende & V.Poelln. (1942): *H. coriacea* (Resende & V.Poelln) Breuer (2010). *H. tessellata* var. *coriacea* f. *longior* Resende & V.Poelln. (1942). *H. tessellata* var. *coriacea* f. *brevior* Resende & V.Poelln. (1942). *H. tessellata* var. *obesa* Resende & V.Poelln. (1942). *H. venosa* ssp. *recurva* sensu Bayer (1976). *H. crousii* [spahlm. *causii*] M.Hayashi in Hawarthiad 15: 16 (2001), **syn. nov.** **H. helensis* **H. mediata*

H. venosa (Lam.) Haw. in Saxifrag. Enum: 51 (1821): *Aloe venosa* Lam. (1873). Lectotype, designated by Scott (1978): Illustration in Commelin, Praeludia Bot.: t. 29 (1703). Epitype, designated by Breuer & Metzger (1997): Swellendam, W of Breede River Bridge, *Bayer 168* (NBG).

= *Aloe tricolor* Haw. (1804). = *Aloe recurva* Haw. (1804): *H. recurva* (Haw.) Haw. (1812). = *H. distincta* Brown (1876). = *H. venosa* var. *oertendahlii* Hjelmquist (1943). **H. irmiae*

H. viscosa (L.) Haw. in Syn. Pl. Succ.: 90 (1812): *Aloe viscosa* L. (1753). Lectotype, designated by Scott (1981): Illustration in Commelin, Praeludia Bot.: t. 31 (1703). Epitype, designated by Breuer & Metzger (1997): Calitzdorp, Blackburn Valley, *Barker 5073* (NBG).

= *Aloe pseudotortuosa* Salm Dyck (1817): *H. pseudotortuosa* (Salm Dyck) Haw. (1819): *H. viscosa* var. *pseudotortuosa* (Salm Dyck) Baker (1880). *Aloe subtortuosa* Salm Dyck (1836). *Aloe tortuosa* Haw. (1804): *H. tortuosa* (Haw.) Haw. (1812). *H. concinna* Haw. (1819): *Aloe concinna* (Haw.) Haw. (1829): *H. viscosa* var. *concinna* (Haw.) Baker (1880). *Aloe tortuosa* var. *major* Salm Dyck (1817). *H. asperiuscula* Haw. (1819): *Aloe asperiuscula* (Haw.) Salm Dyck (1836). *H. cordifolia* Haw. (1819): *Aloe cordifolia* (Haw.) Salm Dyck (1836). *H. indurata* Haw. (1821): *Aloe viscosa* var. *indurata* (Haw.) Salm Dyck (1836): *H. viscosa* var. *indurata* (Haw.) Baker (1880). *H. viscosa* var. *major* Haw. (1821). = *H. viscosa* var. *minor* Haw. (1821). *H. viscosa* var. *parvifolia* Haw. (1821). *H. torquata* Haw. (1827): *Aloe torquata* (Haw.) Salm Dyck (1836): *H. viscosa* var. *torquata* (Haw.) Baker (1880). *H. viscosa* var. *subobtusata* V.Poelln. (1938). *H. viscosa* var. *caespitosa* V.Poelln. (1938). *H. beanii* Smith (1945). *H. beanii* var. *minor* Smith (1945). *H. viscosa* var. *cougaensis* Smith (1945). *H. viscosa* var. *viridissima* Smith (1945). *H. asperiuscula* var. *subintegra* Smith (1945). *H. asperiuscula* var. *patagiata* Smith (1946). *H.*

viscosa var. *quaggaensis* Smith (1948). *H. viscosa* var. *variabilis* Breuer in *Avonia* 21: 61 (2003), **syn. nov.**: *H. variabilis* (Breuer) Breuer (2010).

H. woolleyi V.Poelln. in *Repert. Spec. Nov. Regni Veg.* 42: 269 (1937): *H. venosa* subsp. *woolleyi* (V.Poelln.) Bayer (1999). Lectotype, designated by Breuer & Metzger (1997): [image, later published in *Cact. J. (Croydon)* 7: 3 (1938) (B)].

III. Subgenus *Robustipedunculatae* (Uitewaal) M.B.Bayer [as *Robustipedunculatae* Uitewaal ex M.B.Bayer] in *Haw. Handb.*: 14 (1976). Type species: *Haworthia margaritifera* (L.) Haw. [lecto., designated by Bayer in *Haw. Handb.*: 14 (1976)]. 4 spp.

H. kingiana V.Poelln. in *Cact. J.* 5:31 (1936): *H. subfasciata* var. *kingiana* V.Poelln. (1938). Neotype, designated by Breuer & Metzger (1997): Great Brak, *Dekenah 201* (NBG). = *H. zenigata* M.Hayashi in *Hawarthiad* 15: 20 (2001), **syn. nov.**

H. marginata (Lam.) Stearn in *Cactus J.* 12: 34 (1938): *Aloe marginata* Lam. (1783). Lectotype, designated by Scott (1985): Illustration in Commelin, *Praeludia Bot.*: t. 30 (1703). = *Aloe albicans* Haw. (1804). *H. albicans* (Haw.) Haw. (1812). *H. laevis* Haw. (1821): *H. marginata* var. *laevis* (Haw.) Jacobson (1960). *H. virescens* Haw. (1821): *H. albicans* var. *virescens* (Haw.) Baker (1896): *H. marginata* var. *virescens* (Haw.) Uitew. (1939). *H. ramifera* Haw. (1821): *H. marginata* var. *ramifera* (Haw.) Jacobson (1960).

H. minima (Aiton) Haw. in *Syn. Pl. Succ.*: 92 (1812): *A. margaritifera* var. *minima* Ait. (1789). Lectotype, designated by Scott (1985): Illustration in Dillenius, *Hort. Eltham*: t. 16, f. 18 (1732). = *A. pumila* var. *margaritifera* gamma L. (1753). *Aloe margaritifera* var. *minor* Ait. (1789): *Haworthia minor* (Haw.) Duv. (1809). *Apicra granata* Willd. (1811): *H. granata* (Willd.) Haw. (1819): *A. granata* (Willd.) Schult. & Schult.f. (1829): *H. margaritifera* var. *granata* (Willd.) Baker (1880). *A. margaritifera* var. *minor* Ker-G. (1811). *A. erecta* var. *laetivirens* Salm Dyck (1824). *Aloe erecta* Salm Dyck (1836). *Aloe margaritifera* var. *major* Ait. (1789): *H. major* (Ait.) Duv. (1809). *A. margaritifera* var. *media* DC. (1799). *H. brevis* Haw. (1819): *A. brevis* (Haw.) Schult. & Schult.f. (1829). *H. erecta* Haw. (1819): *A. erecta* (Haw.) Schult. & Schult.f. (1829) [non *A. erecta* Salm Dyck (1836)]: *H. margaritifera* var. *erecta* (Haw.) Baker (1880). *H. margaritifera* var. *corallina* Baker (1880). *H. mutabilis* V.Poelln. (1938). *H. opalina* M.Hayashi in *Haworthiad* 15: 17 (2001), **syn. nov.** **H. flavens* **H. obrata*
H. minima var. **minima**
H. minima var. **poellnitziana** (Uitew.) Bayer in *Haw. Revis.*: 213 (1999): *H. poellnitziana* Uitew. (1939). Type: Drew, *Meiring* (AMD).

H. pumila (L.) Duval. (1809): *Aloe pumila* L. (1753): *Aloe pumila* var. *margaritifera* L. (1753): *Aloe margaritifera* (L.) Burm.f (1768): *H. margaritifera* (L.) Haw. (1819). Lectotype, designated by Scott (1985): Illustration in Commelin, *Horti Med. Amstelod.*: t. 10 (1701). = *Aloe arachnoidea* var. *pumila* Ait. (1789): *A. pumila* (Ait.) Haw. (1804), hom. illegit. non *A. pumila* L. (1753). *Aloe margaritifera* var. *maxima* Haw. (1804): *H. maxima* (Haw.) Duv. (1809): *A. semimargaritifera* var. *maxima* (Haw.) Salm Dyck (1817). *H. margaritifera* var. *semimargaritifera* (Salm Dyck) Baker (1880). *A. papillosa* Salm Dyck (1817): *H. papillosa* (Salm Dyck) Haw. (1819). **H. sparsa*.

Hybrids

**H. mortonii* Breuer in *Alsterworthia* Int. 7: 22 (2007). (*H. minima*X*marginata*).

**H. hammeri* Breuer nn. (*H. mutica*X*mirabilis*).

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