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Transfers of *Lycopodium* Species to *Huperzia*: with a Note on Generic Classification in *Huperziaceae*

Keywords

Generic classification, New nomenclatural combinations, *Lycopodiales*, *Huperziaceae*, *Lycopodiaceae*, *Huperzia*, *Lycopodium*, *Palhinhaea*

Abstract

HOLUB J. (1985): Transfers of *Lycopodium* species to *Huperzia*: with a note on generic classification in *Huperziaceae*. — Folia Geobot. Phytotax., Praha, 20: 67–80. — 203 species of *Lycopodium* are reclassified to *Huperzia* and new nomenclatural combinations are proposed for them. *Huperzia* BERNH. 1801 is accepted in a broad circumscription, i.e. including *Phlegmariurus* (HERTER) HOLUB 1964. New nomenclatural combinations are also proposed for 19 species of *Lycopodium* transferred to the following generic segregates: *Diphasium* (5), *Lycopodiella* (1), *Palhinhaea* (11) and *Pseudolycopodiella* (2).

INTRODUCTION

A long-term study of generic problems within *Lycopodiales* has convinced the present author of the necessity to accept several genera in this group rather than to continue with the classification containing only one genus — *Lycopodium* L. (though the latter is preferred by some distinguished specialists studying this taxonomic group). Of the earlier described genera *Huperzia* BERNH. 1801 and *Diphasium* C. PRESL 1845 were accepted, *Lycopodiella* HOLUB 1964 and *Diphasiastrum* HOLUB 1975 were newly described and most recently also *Lycopodiastrum*, *Pseudodiphasium*, *Pseudolycopodiella* and *Pseudolycopodium* (HOLUB 1983) were added to them. On the base of advice given in the paper on *Lycopodiella* (HOLUB 1964) a further genus *Palhinhaea* AMARAL FRANCO et CARVAL. VASCONCELLOS 1967 was described. Excepting *Huperzia*, all these genera belong to *Lycopodiaceae* containing c. 100–130 species. *Huperzia* (with its c. 450 species) is notable by characteristic isodichotomous bran-

ching, pitted spores, peculiar types of gametophytes, etc. These features differ very substantially from those of other groups in *Lycopodiaceae* so that separation of *Huperzia* to a monotypic family *Huperziaceae* ROTHMALER 1962 is considered here as fully justified.

In 1964 the present author proposed to segregate a group of epiphytic species with distinctly differentiated strobiloids from *Huperzia* as a separate genus — *Phlegmariurus* (HERTER) HOLUB 1964. Though a special, more extensive paper will be devoted to problems of generic classification of *Lycopodiales* (HOLUB, in prep.), it is, however, necessary to give here a brief explanation of why that genus was abandoned, especially with regard to the fact that new nomenclatural combinations with the generic name *Huperzia* are proposed in the following list also for species belonging to this taxonomic group.

The following main characters appeared as important for the segregation of *Phlegmariurus*: the very different habit of plants; the peculiar type of the gametophyte; the special spore-type; difference in basic chromosome numbers.

The dissimilar habit of plants is expressed by the presence of strobiloids which are distinctly different from the vegetative part of the plant body, the pendent and always epiphytic character of plants and by a more simple phyllotaxis. These morphological differences are especially prominent when members of *Phlegmariurus* are compared with the type species of *Huperzia* and one of the evolutionary most primitive species of the genus altogether — *H. selago* (L.) SCHRANK et MART.

Studies carried out in further years and directed to delimiting the two genera have demonstrated great problems and therefore the following two questions have arisen:

1. When *Huperzia* is divided into two genera, where should the limit between them be situated?

2. Should not the two genera be circumscribed rather very narrowly and remaining species classified to further genera? Which criteria should be used in this case?

In the literature the two groups have been delimited very differently. For example NESSEL (1939) also included the group "*Squarrosurus*" in the subgenus *Phlegmariurus* (of the genus *Urostachys*) together with typical members of the last group; on the other hand HERTER (1949) accepted a very narrow circumscription of the group (named by him *Heterourostachys*) — in addition to the series *Squarrosa*, the species of the series *Nutantia* were also excluded by him. In return, BOIVIN (1950) classified in fact all epiphytic species of *Huperzia* s. l. to his *Lycopodium phlegmaria* group (his groups are considered by him possibly classifiable as genera), which represents a substantial enlargement of the group in comparison with HERTER's circumscription (i.e. 10 species groups with at least 150 species will be included here in addition) and therefore also a considerable shifting of limits of the taxonomic group. By this circumscription a taxon would be obtained with certain internal evolutionary linkings but at the same time its particular (though not fully) diagnostic features would be lost. Also the delimitation against the rest of *Huperzia* would be very difficult especially when the close relationship between terrestrial and episaxicolous species on one hand and those between episaxicolous and epiphytic species on other hand is considered.

With regard to the presence of the gametophyte type "*Phlegmaria*" in the group *Carinaturus* (a group transitional between groups with undifferentiated and those with clearly differentiated strobiloids), it would be possible to speculate about the

inclusion of this group (in its delimitation accepted by NESSEL 1939) with relatively distinct strobiloids to *Phlegmariurus*. However, a close relationship exists between *Carinaturus* and other pendent epiphytes of *Huperzia* (the last having wholly indistinct or sometimes also \pm distinct strobiloids); this indicates that the presence of the gametophyte type is not in correlation with the morphology of the fertile part of the plant body. Till now, gametophytes have been studied only in an insignificant number of species of *Huperzia* s. l.; knowledge of them is missing particularly for epiphytic species with undistinguished strobiloids. According to analogy (epiphytic species), it is possible to presume the occurrence of the *Phlegmaria* gametophyte-type in these species but for confirmation of this presupposition it is necessary to obtain concrete evidence.

A broader concept of *Phlegmariurus* than that by HERTER (1949) would be supported also by the repartition pattern of the spore-type *Phlegmaria* in *Huperzia* s. l., as this spore-type is characteristic for almost all pendent epiphytic members of *Huperzia* s. l. (in HERTER's system of *Urostachys* from 1949 in the range of groups *Verticillati* — *Nummulariifolii*). This spore type was, however, found, also in many terrestrial species, e.g. in groups *Pectinatia*, *Hamiltonia*, *Crassistachys* etc., even also in *Lycopodium haleakalae* BRACKENR., closely allied to *L. selago* L., the type species of *Huperzia* BERNH. The spore-type *Phlegmaria* clearly predominates within *Huperzia* s.l. On the other hand the opposite (but closely related) *Selago*-type occurs in the genus more rarely and is known mostly among the evolutionarily primitive members of *Huperzia* constituting groups *Selagina* and *Serrata*. However, there are also data on its occurrence in such species as *Lycopodium fontinaloides* SPRING and *L. squarrosomum* JACQ., members of groups in no way closely related to *L. selago*. Though the character of spores is known for a greater number of the main species of *Huperzia* s.l. and though this feature indicates generally a certain relation to the evolutionary process within this genus, it is not possible to use spore-types as a delimitation base within *Huperzia* s.l., especially with regard to their somewhat dispersed repartition and to absence of coincidence with other characters.

Some authors have seen an important help for generic classification of *Huperzia* s.l. in chromosome numbers as this character has appeared to be to a certain extent helpful for generic classification within *Lycopodiaceae* s.s. The basic chromosome number $x = 11$ has been considered for *Huperzia* s.s., and $x = 17$ for *Phlegmariurus* (LÖVE, LÖVE et PICI SERMOLLI 1977). These basic chromosome numbers have been derived from counts representing high multiples ($16x$, $24x$), where in the given cases ($2n = 264$ and $2n = 272$) counting errors may easily occur. When *Huperzia* was divided only according to basic chromosome numbers by the above mentioned authors, a very heterogeneous genus *Phlegmariurus* was obtained containing also such terrestrial species as *L. hamiltonii* SPRING and especially *L. vernicosum* GREV. et W. J. HOOK., the latter species from the group *Serratae*, very closely allied to the type species of *Huperzia* BERNH. — *H. selago* (L.) SCHRANK et MART. In the present state of knowledge, data on chromosome numbers are not acceptable as a main feature for division of *Huperzia* s.l.

The above brief analysis shows that no one of these single characters can itself give a diagnostic basis for division of *Huperzia* s.l. into two genera. Nor is a division into more genera supported by these characters. Nor do more stable correlations exist among the main diagnostic characters. The evolution (changes) of various characters

has passed within *Huperzia* in the same direction but it is not possible to establish any coincidence of various break-points in this evolution. Several important phylogenetical trends exist with certainty here, passing through the whole group but independently of each other and not delimiting any natural group. If breaks in these single trends were taken as limits of genera, artificial units would come to existence ("form-genera"). The study of changes of the features discussed above is important for knowledge of the probable course of the evolution within the group but not substantial for its taxonomic classification at generic level. In spite of great habit and morphological differences between plants belonging to the initial and final phases of the evolution in this group (*L. selago* L. vs. *L. phlegmaria* L.) it is not possible — according to present knowledge — to delimitate any evolutionarily natural and in fact distinguishable units at the level of genus and therefore *Huperzia* is accepted here as a genus in a broad circumscription. This exposes also a substantial difference between the two families — *Huperziaceae* and *Lycopodiaceae*; while *Lycopodiaceae* with c. 100—130 species may be divided into 10 genera, only one genus may be distinguished in *Huperziaceae* with its 3—4 times more numerous species. Within *Huperzia*, groups of species, however, exist, representing very natural (infrageneric) taxa (many groups of HERTER's system — HERTER 1949) but their close relationship does not allow their exclusion as separate genera, at least according to present knowledge.

The following list of proposed new nomenclatural combinations has followed from the study of herbaria (especially of K and BM) and special literature; it includes 203 new combinations with *Huperzia*. However, it cannot be excluded that some of them were published earlier in the literature not available to the present author, especially after 1975. An appendix is added to this list, containing 19 nomenclatural combinations proposed after generic reclassification for species of the family *Lycopodiaceae* s.s.

COMBINATIONES NOVAE IN *HUPERZIA* BERNH.

- Huperzia acerosa* (Sw.) HOLUB, comb. nova. — Bas.: *Lycopodium acerosum* SWARTZIUS Fl. Indiae Occident. 3: 1575, Erlangae 1806.
- Huperzia albescens* (F. M. BAILEY) HOLUB, comb. nova. — Bas.: *Lycopodium albescens* F. M. BAILEY, Queensland Dep. Agric., Bot. Bull. 14: 16, Brisbane 1896.
- Huperzia amentacea* (ØLLGARD) HOLUB, comb. nova. — Bas.: *Lycopodium amentaceum* ØLLGARD, Amer. Fern Journ. 72: 53, Washington 1982.
- Huperzia andina* (ROSENST.) HOLUB, comb. nova. — Bas.: *Lycopodium andinum* ROSENSTOCK, Fedde Repert. Spec. Nov. Regni Vegetab. 5: 239, Berlin-Wilmersdorf 1908.
- Huperzia apolinari-mariae* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys apolinari-mariae* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 36: 177, Berlin-Dahlem 1934 [ut "*Apolinar Mariae*"].
- Huperzia archboldiana* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys archboldianus* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 39: 61, Berlin-Dahlem 1935.
- Huperzia arthuri* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys arthuri* HERTER, Revista Sudamer. Bot. 10: 114, Montevideo 1953.
- Huperzia ascendens* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys ascendens* HERTER ex NESSEL, Revista Sudamer. Bot. 6: 161, Montevideo 1940.
- Huperzia aschersonii* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium aschersonii* HERTER, Bot. Jahrb. Syst., 43, Beibl. 98: 53, Leipzig 1909.
- Huperzia australiana* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium australianum* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 42, Leipzig 1909.

- Huperzia australis* (WILLD.) HOLUB, comb. nova. — Bas.: *Lycopodium australe* WILLDENOW Spec. Plant. 5: 11, Berolini 1810.
- Huperzia balansae* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium balansae* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 51, Leipzig 1909.
- Huperzia banayanica* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys banayanicus* HERTER, Bot. Archiv 3: 17, Dahlem/Berlin 1923 [15. I.]; Philipp. Journ. Sci., Bot., 22: 66, Manila 1923 [24. 1.].
- Huperzia beccarii* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium beccarii* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg, Ser. 2, 7: 29, 1912.
- Huperzia bifida* (WILLD.) HOLUB, comb. nova. — Bas.: *Lycopodium bifidum* HUMBOLDT et BONPLAND ex WILLDENOW Spec. Plant. 5: 53, Berolini 1810.
- Huperzia bififormis* (W. J. HOOK.) HOLUB, comb. nova. — Bas.: *Lycopodium bifforme* W. J. HOOKER Icon. Plant. 3, tab. 228, London 1840.
- Huperzia blepharodes* (MAXON) HOLUB, comb. nova. — Bas.: *Lycopodium blepharodes* MAXON, Contrib. U.S. Nation. Herb. 17: 423, Washington 1914.
- Huperzia bolanicum* (ROSENST.) HOLUB, comb. nova. — Bas.: *Lycopodium bolanicum* ROSENSTOCK, Fedde Repert. Spec. Nov. Regni Vegetab. 12: 181, Berlin-Dahlem 1913.
- Huperzia bonapartei* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys bonapartei* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 36: 182, Berlin-Dahlem 1934.
- Huperzia brachiata* (MAXON) HOLUB, comb. nova. — Bas.: *Lycopodium brachiatum* MAXON, Contrib. U.S. Nation. Herb. 17/2: 176, Washington 1913.
- Huperzia bradeorum* (CHRIST) HOLUB, comb. nova. — Bas.: *Lycopodium bradeorum* CHRIST, Fedde Repert. Spec. Nov. Regni Vegetab. 8: 20, Berlin-Wilmersdorf 1910.
- Huperzia brassii* (COPEL.) HOLUB, comb. nova. — Bas.: *Lycopodium brassii* COPELAND, Journ. Arnold Arbor. 10: 174, Lancaster 1929.
- Huperzia brevifolia* (W. J. HOOK. et GREV. in W. J. HOOK.) HOLUB, comb. nova. — Bas.: *Lycopodium brevifolium* W. J. HOOKER et GREVILLE in W. J. HOOKER Bot. Miscell. 3: 104, London 1833.
- Huperzia callitrichifolia* (A. BR.) HOLUB, comb. nova. — Bas.: *Lycopodium callitrichifolium* METTENIUS ex A. BRAUN, Annal. Sci. Natur., Bot., Ser. 5, 3: 309, Paris 1865 [ut "*callitrichae-folium*"].
- Huperzia campestris* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium campestre* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg, Ser. 2, 24: 3, 1917.
- Huperzia capellae* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium capellae* HERTER, Revista Sudamer. Bot. 10: 114, Montevideo 1953.
- Huperzia capillaris* (SODIRO) HOLUB, comb. nova. — Bas.: *Lycopodium capillare* SODIRO Recensio Cryptogam. Vascul. Quitenses, 90, Quito 1883.
- Huperzia caracasica* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium caracasicum* HERTER, Hedwigia 49: 88, tab. 3A, Dresden 1909.
- Huperzia catharinae* (CHRIST) HOLUB, comb. nova. — Bas.: *Lycopodium catharinae* CHRIST, Bull. Herb. Boissier, Ser. 2, 2: 700, Genève 1902.
- Huperzia caudifolia* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium caudifolium* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg, Ser. 2, 1: 14, 1911.
- Huperzia chiricana* (MAXON) HOLUB, comb. nova. — Bas.: *Lycopodium chiricanum* MAXON, Contrib. U.S. Nation. Herb. 17/2: 176, Washington 1913.
- Huperzia christii* (ALV. SILVEIRA) HOLUB, comb. nova. — Bas.: *Lycopodium christii* ALVARO SILVEIRA, Bolet. Commiss. Geogr. Geolog. Estade Minas Geraes 2/5: 117, tab. 1, 1898.
- Huperzia clarae* (F. M. BAILEY) HOLUB, comb. nova. — Bas.: *Lycopodium clarae* F. M. BAILEY, Queensland Bull. 21, Bot. Bull. 7: 69, Brisbane 1893.
- Huperzia coralina* (SPRING in MIQUEL et al.) HOLUB, comb. nova. — Bas.: *Lycopodium coralium* SPRING in MIQUEL et al. Plant. Junghuhnianae, 273, Leiden 1854.
- Huperzia costaricensis* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys costaricensis* HERTER, Amer. Fern Journ. 48: 83, Lancaster 1958.
- Huperzia crebra* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium crebre* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg, Ser. 2, 24: 4, 1917.
- Huperzia cubana* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium cubanum* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 50, Leipzig 1909.

- Huperzia cuernavacensis* (UNDERW. et LLOYD) HOLUB, comb. nova. — Bas.: *Lycopodium cuernavacense* UNDERWOOD et LLOYD, Bull. Torrey Bot. Club 33: 110, New York 1906.
- Huperzia cumingii* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys cumingii* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 36: 178, tab. 170, Berlin-Dahlem 1934.
- Huperzia cuneifolia* (HIERON.) HOLUB, comb. nova. — Bas.: *Lycopodium cuneifolium* HIERN, Bot. Jahrb. Syst. 34: 572, Leipzig 1905.
- Huperzia cunninghamioides* (HAYATA) HOLUB, comb. nova. — Bas.: *Lycopodium cunninghamioides* HAYATA Icon. Plant. Formos. 4: 131, Taihoku 1914.
- Huperzia curvifolia* (KUNZE) HOLUB, comb. nova. — Bas.: *Lycopodium curvifolium* KUNZE, Linnaea 9: 5, Halle 1835.
- Huperzia delbrueckii* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys delbrueckii* HERTER, Bot. Archiv 3: 19, Dahlem/Berlin 1923 [15. I.]; Philipp. Journ. Sci., Bot., 22: 68, Manila 1923 [24. I.].
- Huperzia dentata* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium dentatum* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 41, Leipzig 1909.
- Huperzia dichaeoides* (MAXON) HOLUB, comb. nova. — Bas.: *Lycopodium dichaeoides* MAXON, Proceed. Biol. Soc. Washington 18: 231, 1905.
- Huperzia dielsii* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium dielsii* HERTER, Bot. Jahrb. Syst. 54: 229, Leipzig 1916.
- Huperzia durissima* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium durissimum* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 52, Leipzig 1909.
- Huperzia ecuadorica* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium ecuadoricum* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 48, Leipzig 1909.
- Huperzia edanoi* (COPEL.) HOLUB, comb. nova. — Bas.: *Lycopodium edanoi* COPELAND, Philipp. Journ. Sci., Bot., 46: 309, Manila 1931.
- Huperzia elmeri* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys elmeri* HERTER, Bot. Archiv 3: 16, Dahlem/Berlin 1923 [15. I.]; Philipp. Journ. Sci., Bot., 22: 65, Manila 1923 [24. I.].
- Huperzia eremorum* (ROLLERI) HOLUB, comb. nova. — Bas.: *Lycopodium eremorum* ROLLERI, Hickenia 1 (26): 141, San Isidro 1978.
- Huperzia ericifolia* (C. PRESL) HOLUB, comb. nova. — Bas.: *Lycopodium ericifolium* C. PRESL, Reliquiae Haenkeanae 1: 77, Pragae 1825 [ut "ericaefolium"].
- Huperzia erubescens* (BRACKENR. in WILKES) HOLUB, comb. nova. — Bas.: *Lycopodium erubescens* BRACKENRIDGE Botany, Cryptogamia, Filices; in C. WILKES U. S. Explor. Expedition 16: 320, Philadelphia 1854.
- Huperzia erythrocaulon* (FÉE) HOLUB, comb. nova. — Bas.: *Lycopodium erythrocaulon* FÉE Cryptogam. Vascul. Brésil 2: 95, tab. 106, fig. 2, Paris 1873.
- Huperzia everettii* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium everettii* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 43, Leipzig 1909.
- Huperzia fargesii* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium fargesii* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 48, Leipzig 1909.
- Huperzia filiformis* (Sw.) HOLUB, comb. nova. — Bas.: *Lycopodium filiforme* SWARTZ Synopsis Filicum, 174, tab. 4, fig. 2, Kiliae 1806.
- Huperzia firma* (A. BR.) HOLUB, comb. nova. — Bas.: *Lycopodium firmum* METTENIUS ex A. BRAUN, Annal. Sci. Natur., Bot., Ser. 5, 3: 307, Paris 1865.
- Huperzia flaccida* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys flaccidus* HERTER, Fedde Repert. Spec. Nov. Regni Vegetab. 19: 164, Berlin-Dahlem 1923.
- Huperzia flagellacea* (KUHN) HOLUB, comb. nova. — Bas.: *Lycopodium flagellaceum* KUHN Forschungsreise Gazelle 4, Bot., 15, Berlin 1889.
- Huperzia foliacea* (MAXON) HOLUB, comb. nova. — Bas.: *Lycopodium foliaceum* MAXON, Smithsonian Miscell. Collections 56 (29): 1, tab. 1, Washington 1912.
- Huperzia foliosa* (COPEL.) HOLUB, comb. nova. — Bas.: *Lycopodium foliosum* COPELAND, Bernice Bishop Mus. Bull. 59: 7, Honolulu 1929.
- Huperzia fordii* (BAKER) HOLUB, comb. nova. — Bas.: *Lycopodium fordii* BAKER Handb. Fern Allies, 17, London 1887.
- Huperzia fuegiana* (ROIVAINEN) HOLUB, comb. nova. — Bas.: *Lycopodium fuegianum* ROIVAINEN, Annal. Bot. Soc. Zool.-Bot. Fenn. Vanamo 6 (8): 15, Helsinki 1936.

- Huperzia galapagensis* (O. HAMANN) HOLUB, status novus et comb. nova. — Bas.: *Lycopodium setaceum* LAM. subsp. *galapagensis* O. HAMANN, Bot. Notiser 127: 252, Lund 1974.
- Huperzia gedeanana* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium gedeanum* van ALDERWERELT van ROSENBURGH Malayan Ferns and Fern Allies Handb., Suppl. 1, Corrections, 65, Batavia 1917; Bull. Jard. Bot. Buitenzorg, Ser. 2, 28: 43, tab. 8, 1918.
- Huperzia gehrtii* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys gehrtii* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 36: 189, Berlin-Dahlem 1934.
- Huperzia gigantea* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys verticillatus* (L. fil.) HERTER var. *giganteus* HERTER, Bot. Archiv 3: 13, Berlin-Dahlem 1923 [15. I.]; Philipp. Journ. Sci., Bot., 22: 62, Manila 1923 [24. I.]. — Syn.: *Urostachys giganteus* (HERTER) NESSEL Bärlappgewächse, 124, Jena 1939.
- Huperzia goebelii* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys goebelii* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 36: 188, tab. 175, Berlin-Dahlem 1934.
- Huperzia goliathensis* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium goliathense* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg, Ser. 2, 7: 29, 1912.
- Huperzia goudotii* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium goudotii* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 47, Leipzig 1909.
- Huperzia guangdongensis* (CHING) HOLUB, comb. nova. — Bas.: *Phlegmariurus guangdongensis* CHING, Acta Bot. Yunnanica 4: 123, Kunming 1982.
- Huperzia gunturensis* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium gunturensis* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg, Ser. 2, 1: 14, 1911.
- Huperzia haeckelii* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium haeckelii* HERTER, Fedde Repert. Spec. Nov. Regni Vegetab. 5: 22, Berlin-Dahlem 1908.
- Huperzia haitiensis* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys haitiensis* HERTER, Fedde Repert. Spec. Nov. Regni Vegetab. 19: 161, Berlin-Dahlem 1923.
- Huperzia haleakalae* (BRACKENR. in WILKES) HOLUB, comb. nova. — Bas.: *Lycopodium haleakalae* BRACKENRIDGE Botany, Cryptogamia, Filices; in C. WILKES U.S. Explor. Expedition 16: 312, tab. 45, Philadelphia 1854.
- Huperzia harmsii* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys harmsii* HERTER ex NESSEL, Revista Sudamer. Bot. 6: 166, Montevideo 1940.
- Huperzia hellwigii* (O. WARB.) HOLUB, comb. nova. — Bas.: *Lycopodium hellwigii* O. WARBURG, Monsumia 1: 97, Leipzig 1900.
- Huperzia helmii* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys helmii* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 36: 186, Berlin-Dahlem 1934.
- Huperzia henryi* (BAKER) HOLUB, comb. nova. — Bas.: *Lycopodium henryi* BAKER, Kew Bull. 1906: 15, London 1906.
- Huperzia heroldii* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys heroldii* NESSEL, Revista Sudamer. Bot. 6: 167, Montevideo 1940.
- Huperzia heterocarpon* (FÉE) HOLUB, comb. nova. — Bas.: *Lycopodium heterocarpon* FÉE Cryptogam. Vascul. Brésil 2: 93, Paris 1873.
- Huperzia heteroclita* (DESV. in POIR.) HOLUB, comb. nova. — Bas.: *Lycopodium heteroclitum* DESVAUX in POIRET, Encyclop. Méthod., Bot., Suppl. 3: 544, Paris 1813.
- Huperzia hilliana* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys hillianus* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 36: 186, tab. 174, Berlin-Dahlem 1934.
- Huperzia hippuridea* (CHRIST in PITTIER) HOLUB, comb. nova. — Bas.: *Lycopodium hippurideum* CHRIST in PITTIER Primitia Fl. Costaricensis 3/1: 56, San José da Costa Rica 1901.
- Huperzia hohenackeri* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium hohenackeri* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 46, Leipzig 1909.
- Huperzia homocarpa* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys homocarpus* HERTER, Fedde Repert. Spec. Nov. Regni Vegetab. 19: 163, Berlin-Dahlem 1923.
- Huperzia horizontalis* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys horizontalis* [ALDERW. ROSENB.] HERTER ex NESSEL Bärlappgewächse, 225, Jena 1939. [= *Urostachys aellenii* HERTER 1949, nomen illegitimum].
- Huperzia hystrix* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys hystrix* HERTER, Revista Sudamer. Bot. 10: 119, Montevideo 1953.
- Huperzia jamesonii* (BAKER) HOLUB, comb. nova. — Bas.: *Lycopodium jamesonii* BAKER Handb. Fern Allies, 9, London 1887.

- Huperzia jenmannii* (UNDERW. et LLOYD) HOLUB, comb. nova. — Bas.: *Lycopodium jenmannii* UNDERWOOD et LLOYD, Bull. Torrey Bot. Club 33: 112, New York 1906.
- Huperzia juniperistachya* (HAYATA) HOLUB, comb. nova. — Bas.: *Lycopodium juniperistachyum* HAYATA Icon. Plant. Formos. 4: 132, Taihoku 1914.
- Huperzia kandavuensis* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys kandavuensis* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 39: 67, Berlin-Dahlem 1935.
- Huperzia kaysseri* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys kaysseri* HERTER ex NESSEL, Revista Sudamer. Bot. 6: 156, Montevideo 1940.
- Huperzia lancifolia* (MAXON) HOLUB, comb. nova. — Bas.: *Lycopodium lancifolium* MAXON, Contrib. U.S. Nation. Herb. 17/2: 177, Washington 1913.
- Huperzia lauterbachii* (E. PRITZEL ap. SCHUMANN et LAUTERBACH) HOLUB, comb. nova. — Bas.: *Lycopodium lauterbachii* E. PRITZEL apud K. SCHUMANN et LAUTERBACH Fl. Deutsch. Schutzgeb. Südsee, 149, 1900.
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- Huperzia lecomteana* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys lecomteanus* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 36: 187, Berlin-Dahlem 1934.
- Huperzia ledermannii* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium ledermannii* HERTER, Bot. Jahrb. Syst. 54: 232, fig. 2 (p. 233), Leipzig 1916.
- Huperzia leitzi* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys leitzi* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 36: 184, Berlin-Dahlem 1934.
- Huperzia lellingeri* (ROLLERI) HOLUB, comb. nova. — Bas.: *Lycopodium lellingeri* ROLLERI, Hickenia 1 (26): 143, San Isidro 1978.
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- Huperzia lindaviana* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium lindavianum* HERTER, Hedwigia 49: 90, Dresden 1909.
- Huperzia lindeneri* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys lindeneri* HERTER ex NESSEL, Revista Sudamer. Bot. 6: 164, Montevideo 1940.
- Huperzia longearistata* (CHRIST in SCHWACKE) HOLUB, comb. nova. — Bas.: *Lycopodium longearistatum* CHRIST in SCHWACKE Plant. Nov. Mineirias 2: 40, Cidado de Minas 1900; CHRIST, Bull. Herb. Boissier, Ser. 2, 2: 703, Genève 1902.
- Huperzia luederwaldtii* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys luederwaldtii* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 36: 178, Berlin-Dahlem 1934.
- Huperzia macgregorii* (BAKER) HOLUB, comb. nova. — Bas.: *Lycopodium macgregorii* BAKER, Journ. Bot. 28: 109, London 1890 [ut „*macgregori*“].
- Huperzia macrostachys* (SPRING) HOLUB, comb. nova. — Bas.: *Lycopodium macrostachys* W. J. HOOKER ex SPRING Monogr. Fam. Lycopod. 2: 30, Bruxelles 1849.
- Huperzia magnusiana* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium magnusianum* HERTER, Hedwigia 49: 91, Dresden 1909.
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- Huperzia merrillii* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys merrillii* HERTER, Bot. Archiv 3: 15, Dahlem/Berlin 1923 [15. I.]; Philipp. Journ. Sci., Bot., 22: 64, Manila 1923 [24. I.].
- Huperzia mexicana* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium mexicanum* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 49, Leipzig 1909.
- Huperzia mingcheensis* (CHING) HOLUB, comb. nova. — Bas.: *Phlegmariurus mingcheensis* CHING, Acta Bot. Yunnanica 4: 125, Kunming 1982.
- Huperzia minima* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys minimus* HERTER, Bot. Archiv 3: 13, Dahlem/Berlin 1923 [15. I.]; Philipp. Journ. Sci., Bot., 22: 61, Manila 1923 [24. I.].
- Huperzia minutifolia* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium coralium* SPRING var. *minutifolia* van ALDERWERELT van ROSENBURGH Malayan Fern and Fern Allies Handb., 44, Batavia 1915. — Syn.: *Lycopodium minutifolium* (ALDERW. ROSENB.) ALDERW. ROSENB., Bull. Jard. Bot. Buitenzorg, Ser. 2, 28: 44, 1918.

- Huperzia mollicoma* (SPRING) HOLUB, comb. nova. — Bas.: *Lycopodium dichotomum* JACQ. subsp. *mollicomum* [MART. ex] SPRING, Flora 21: 162, Regensburg 1838. — Syn.: *Lycopodium mollicomum* (SPRING) SPRING Fl. Brasil. 1: 113, 1840 [n. v.]; BAKER Handb. Fern Allies, 14, London 1887.
- Huperzia molongensis* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium molongense* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 51, Leipzig 1909.
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- Huperzia monticola* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium monticolum* van ALDERWERELT van ROSENBURGH Malayan Ferns and Fern Allies Handb., Suppl. 1, Corrections, 65, Batavia 1917; Bull. Jard. Bot. Buitenzorg, Ser. 2, 28: 43, tab. 7, 1918.
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- Huperzia mortonii* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys mortonii* HERTER, Fedde Repert. Spec. Nov. Regni Vegetab. 28: 108, Berlin-Dahlem 1930.
- Huperzia multifaria* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium multifarium* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg, Ser. 3, 5: 226, 1922.
- Huperzia myriophylla* (HAYATA) HOLUB, comb. nova. — Bas.: *Lycopodium serratum* THUNB. var. *myriophyllum* HAYATA Icon. Plant. Formos. 4: 133, Taihoku 1914. — Syn.: *Urostachys myriophyllum* (HAYATA) HERTER Index Lycopod., 71, Montevideo 1949.
- Huperzia myrtifolia* (G. FORSTER) HOLUB, comb. nova. — Bas.: *Lycopodium myrtifolium* G. FORSTER Florulae Insul. Austral. Prodr., 87, Gottingae 1786.
- Huperzia neocaledonica* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys neocaledonicus* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 36: 187, Berlin-Dahlem 1934.
- Huperzia novae-zelandiae* (COLENZO) HOLUB, comb. nova. — Bas.: *Lycopodium novae-zelandiae* COLENZO, Transact. Proceed. New Zealand Inst. 19: 275, Wellington 1887.
- Huperzia ocanana* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium ocananum* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 45, Leipzig 1909.
- Huperzia oceanica* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium oceanicum* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 52, Leipzig 1909.
- Huperzia oltmannsii* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys oltmannsii* HERTER ex NESSEL, Revista Sudamer. Bot. 6: 168, Montevideo 1940.
- Huperzia orizabae* (UNDERW. et LLOYD) HOLUB, comb. nova. — Bas.: *Lycopodium orizabae* UNDERWOOD et LLOYD, Bull. Torrey Bot. Club 33: 110, New York 1906.
- Huperzia pachyphylla* (KUEN ap. E. PRITZEL) HOLUB, comb. nova. — Bas.: *Lycopodium pachyphyllum* KUHN apud E. PRITZEL in ENGLER et PRANTL Natürl. Pflanzenfam. 1/4: 599, Leipzig 1900; HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 51, Leipzig 1909.
- Huperzia papillata* (ROLLERI) HOLUB, comb. nova. — Bas.: *Lycopodium papillatum* ROLLERI, Amer. Fern Journ. 65: 3, Washington 1975.
- Huperzia parksii* (COPEL.) HOLUB, comb. nova. — Bas.: *Lycopodium parksii* COPELAND, Bernice Bishop Mus. Bull. 59: 8, Honolulu 1929.
- Huperzia patentissima* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium patentissimum* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg, Ser. 2, 24: 4, 1917.
- Huperzia pearcei* (BAKER) HOLUB, comb. nova. — Bas.: *Lycopodium pearcei* BAKER Handb. Fern Allies, 14, London 1887.
- Huperzia phelpsii* (VARESCHI) HOLUB, comb. nova. — Bas.: *Lycopodium phelpsii* VARESCHI, Acta Bot. Venezuel. 1/2: 89, Caracas 1966.
- Huperzia phyllicifolia* (DESV. in POIR.) HOLUB, comb. nova. — Bas.: *Lycopodium phyllicifolium* DESVAUX in POIRET, Encyclop. Méthod., Bot., Suppl. 3: 546, Paris 1813 [ut "*phyllicae-folium*"].
- Huperzia phyllantha* (W. J. HOOK. et WALKER-ARNOTT) HOLUB, comb. nova. — Bas.: *Lycopodium phyllanthum* W. J. HOOKER et WALKER-ARNOTT Botany Captain Beechey's Voyage, 102, London 1832.
- Huperzia picardae* (CHRIST ap. URBAN) HOLUB, comb. nova. — Bas.: *Lycopodium picardae* CHRIST apud URBAN, Bot. Jahrb. Syst. 24: 148, Leipzig 1897.
- Huperzia pilgeriana* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys pilgerianus* HERTER ex NESSEL, Revista Sudamer. Bot. 6: 161, Montevideo 1940.

- Huperzia pithyoides* (SCHLECHTEND. et CHAM.) HOLUB, comb. nova. — Bas.: *Lycopodium pithyoides* SCHLECHTENDAL et CHAMISSO, *Linnaea* 5: 623, Berlin 1830.
- Huperzia pittieri* (CHRIST) HOLUB, comb. nova. — Bas.: *Lycopodium pittieri* CHRIST, *Bull. Soc. Bot. Genève*, Ser. 2, 1: 236, 1909.
- Huperzia polaris* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys varius* (R. BR.) HERTER var. *polaris* HERTER ex NESSEL, *Revista Sudamer. Bot.* 6: 165, Montevideo 1940. — Syn.: *Urostachys polaris* (NESSEL) HERTER 1949.
- Huperzia porophila* (LLOYD et UNDERW.) HOLUB, comb. nova. — Bas.: *Lycopodium porophilum* LLOYD et UNDERWOOD, *Bull. Torrey Bot. Club* 27: 150, New York 1900.
- Huperzia pringlei* (UNDERW. et LLOYD) HOLUB, comb. nova. — Bas.: *Lycopodium pringlei* UNDERWOOD et LLOYD, *Bull. Torrey Bot. Club* 33: 109, New York 1906.
- Huperzia pruinosa* (HIERON. et HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium pruinosum* HIERONYMUS et HERTER, *Bot. Jahrb. Syst.* 43, Beibl. 98: 52, Leipzig 1909.
- Huperzia pseudophlegmaria* (KUHN) HOLUB, comb. nova. — Bas.: *Lycopodium pseudophlegmaria* KUHN *Forschungsreise Gazelle 4, Botanik*, 16, Berlin 1889.
- Huperzia reflexo-integra* (HAYATA) HOLUB, comb. nova. — Bas.: *Lycopodium reflexo-integrum* HAYATA *Icon. Plant. Formos.* 5: 254, fig. 90, Taihoku 1915.
- Huperzia ribourtii* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium ribourtii* HERTER, *Bot. Jahrb. Syst.* 43, Beibl. 98: 53, Leipzig 1909.
- Huperzia rigida* (J. F. GMEL.) HOLUB, comb. nova. — Bas.: *Lycopodium rigidum* J. F. GMELIN C. Linné, *Syst. Naturae*, ed. 13, 2/2: 1289, Lipsiae 1791.
- Huperzia rimbachii* (SODIRO) HOLUB, comb. nova. — Bas.: *Lycopodium rimbachii* SODIRO *Cryptogam. Vascul. Quitenses*, 566, Quito 1893.
- Huperzia robusta* (KLOTZSCH) HOLUB, comb. nova. — Bas.: *Lycopodium robustum* KLOTZSCH, *Linnaea* 18: 518, Halle 1844.
- Huperzia rosenstockiana* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium rosenstockianum* HERTER, *Hedwigia* 49: 90, Dresden 1909.
- Huperzia rostrifolia* (ALV. SILVEIRA) HOLUB, comb. nova. — Bas.: *Lycopodium rostrifolium* ALVARO SILVEIRA, *Bolet. Commiss. Geogr. Geolog. Estade Minas Geraes* 5/2: 118, tab. 2, 1898.
- Huperzia rubricaulis* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium rubricaulis* van ALDERWERELT van ROSENBURGH, *Bull. Jard. Bot. Buitenzorg*, Ser. 2, 24: 3, 1917.
- Huperzia rupicola* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium rupicolum* ALDERWERELT van ROSENBURGH, *Bull. Jard. Bot. Buitenzorg*, Ser. 2, 16: 39, 1914.
- Huperzia salvinioides* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys salvinioides* HERTER, *Bot. Archiv* 3: 18, Dahlem/Berlin 1923 [15. I.]; *Philipp. Journ. Sci.*, Bot., 22: 67, Manila 1923 [24. I.].
- Huperzia samoana* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys samoanus* NESSEL, *Revista Sudamer. Bot.* 6: 163, Montevideo 1940.
- Huperzia schlechtendalii* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys schlechtendalii* NESSEL, *Revista Sudamer. Bot.* 6: 164, Montevideo 1940.
- Huperzia schlechteri* (E. PRITZEL) HOLUB, comb. nova. — Bas.: *Lycopodium schlechteri* E. PRITZEL, *Bot. Jahrb. Syst.* 39: 14, Leipzig 1906.
- Huperzia schmidchenii* (HIERON.) HOLUB, comb. nova. — Bas.: *Lycopodium schmidchenii* HIERONYMUS, *Bot. Jahrb. Syst.* 34: 570, Leipzig 1905.
- Huperzia schneei* (VARESCHI) HOLUB, comb. nova. — Bas.: *Lycopodium schneei* VARESCHI, *Acta Bot. Venezuel.* 1/2: 83, Caracas 1966.
- Huperzia setifolia* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium setifolium* van ALDERWERELT van ROSENBURGH, *Bull. Jard. Bot. Buitenzorg*, Ser. 2, 16: 40, 1914.
- Huperzia sieboldii* (MIQUEL) HOLUB, comb. nova. — Bas.: *Lycopodium sieboldii* MIQUEL, *Annal. Mus. Bot. Lugd.-Batav.* 3: 184, Amstelodami et Traiecti ad Rhenum 1867.
- Huperzia simonii* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys simonii* NESSEL, *Revista Sudamer. Bot.* 6: 167, Montevideo 1940.
- Huperzia sintenisii* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys sintenisii* NESSEL, *Fedde Repert. Spec. Nov. Regni Vegetab.* 19: 161, Berlin-Dahlem 1923.
- Huperzia smithiana* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys smithianus* NESSEL, *Fedde Repert. Spec. Nov. Regni Vegetab.* 36: 185, Berlin-Dahlem 1935.

- Huperzia sodiroana* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium sodiroanum* HERTER, Hedwigia 49: 91, Dresden 1909.
- Huperzia sootiana* (LAWALRÉE) HOLUB, comb. nova. — Bas.: *Phlegmariurus sootianus* LAWALRÉE, Acta Bot. Acad. Sci. Hungar. 19: 195, Budapest 1973.
- Huperzia sotae* (ROLLERI) HOLUB, comb. nova. — Bas.: *Lycopodium sotae* ROLLERI, Darwiniana 16: 130, San Isidro 1970.
- Huperzia sprengeri* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys sprengeri* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 36: 179, tab. 171, Berlin-Dahlem 1934.
- Huperzia springii* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys springii* HERTER ex NESSEL, Revista Sudamer. Bot. 6: 161, Montevideo 1940.
- Huperzia stuebelii* (HIERON. et HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium stuebelii* HIERONYMUS et HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 153, Leipzig 1909.
- Huperzia subfalciiformis* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium subfalciiforme* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg 28: 44, 1918.
- Huperzia subtubulosa* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys subtubulosus* HERTER, Fedde Repert. Spec. Nov. Regni Vegetab. 19: 166, Berlin-Dahlem 1923.
- Huperzia subulata* (DESV. in POIR.) HOLUB, comb. nova. — Bas.: *Lycopodium subulatum* DESVAUX in POIRET, Encyclop. Méthod., Bot., Suppl. 3: 544, Paris 1813.
- Huperzia sumatrana* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium sumatranum* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg, Ser. 2, 28: 44, 1918.
- Huperzia taiwanensis* (CHING) HOLUB, comb. nova. — Bas.: *Phlegmariurus taiwanensis* CHING, Acta Bot. Yunnanica 4: 124, Kunming 1982.
- Huperzia talamauana* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium talamauanum* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg, Ser. 2, 28: 45, 1918.
- Huperzia tetrasticha* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium tetrastichum* KUNZE ex van ALDERWERELT van ROSENBURGH Malayan Ferns and Fern Allies Handb., Suppl. 1: 529, Batavia 1917.
- Huperzia terrae-guilelmii* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium terrae-guilelmii* HERTER, Bot. Jahrb. Syst. 54: 229, Leipzig 1916 [ut "*terrae guilelmii*"].
- Huperzia thwaitesii* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys thwaitesii* HERTER ex NESSEL, Revista Sudamer. Bot. 6: 158, Montevideo 1940.
- Huperzia toppingii* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys toppingii* HERTER, Bot. Archiv 3: 15, Dahlem/Berlin 1923 [15. L.]; Philipp. Journ. Sci., Bot., 22: 63, Manila 1923 [24. L.].
- Huperzia tournayana* (LAWALRÉE) HOLUB, comb. nova. — Bas.: *Phlegmariurus tournayanus* LAWALRÉE, Acta Bot. Acad. Sci. Hungar. 19: 197, Budapest 1973.
- Huperzia transilla* (SODIRO ap. BAKER) HOLUB, comb. nova. — Bas.: *Lycopodium transilla* SODIRO apud BAKER, Journ. Bot. 15: 168, London 1877.
- Huperzia trifoliata* (COPEL.) HOLUB, comb. nova. — Bas.: *Lycopodium trifoliatum* COPELAND, Bernice Bishop Mus. Bull. 59: 7, Honolulu 1929.
- Huperzia tuerckheimii* (MAXON) HOLUB, comb. nova. — Bas.: *Lycopodium tuerckheimii* MAXON, Contrib. U.S. Nation. Herb. 13: 23, tab. 1, Washington 1909.
- Huperzia ulei* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys ulei* HERTER, Fedde Repert. Spec. Nov. Regni Vegetab. 19: 162, Berlin-Dahlem 1923.
- Huperzia ulixis* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys ulixis* HERTER, Revista Sudamer. Bot. 10: 115, Montevideo 1953.
- Huperzia underwoodiana* (MAXON) HOLUB, comb. nova. — Bas.: *Lycopodium underwoodianum* MAXON, Contrib. U.S. Nation. Herb. 13/1: 41, Washington 1909.
- Huperzia urbanii* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium urbanii* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 44, Leipzig 1909.
- Huperzia vanikorensis* (COPEL.) HOLUB, comb. nova. — Bas.: *Lycopodium vanikorense* COPELAND, Journ. Arnold Arbor. 12: 48, Lancaster 1931.
- Huperzia venezuelanica* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium venezuelanicum* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 43, Leipzig 1909.
- Huperzia versteegii* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium versteegii* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg, Ser. 2, 24: 4, 1917.

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- Huperzia weberbaueri* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys weberbaueri* NESSEL, Revista Sudamer. Bot. 6: 162, Montevideo 1940.
- Huperzia weddellii* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium weddellii* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 45, Leipzig 1909.
- Huperzia whartoniensis* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys whartoniensis* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 39: 62, Berlin-Dahlem 1935.
- Huperzia whitfordii* (HERTER) HOLUB, comb. nova. — Bas.: *Urostachys whitfordii* HERTER, Bot. Archiv 3: 14, Dahlem/Berlin 1923 [15. I.]; Philipp. Journ. Sci., Bot., 22: 63, Manila 1923 [24. I.].
- Huperzia wohlberedtii* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys wohlberedtii* NESSEL, Fedde Repert. Spec. Nov. Regni Vegetab. 39: 69, Berlin-Dahlem 1935.
- Huperzia yakusimensis* (NESSEL) HOLUB, comb. nova. — Bas.: *Urostachys yakusimensis* HERTER ex NESSEL, Revista Sudamer. Bot. 6: 160, Montevideo 1940.
- Huperzia yunnanensis* (CHING) HOLUB, comb. nova. — Bas.: *Phlegmariurus yunnanensis* CHING, Acta Bot. Yunnanica 4: 121, Kunming 1982.
- Huperzia zollingeri* (HERTER) HOLUB, comb. nova. — Bas.: *Lycopodium zollingeri* HERTER, Bot. Jahrb. Syst. 43, Beibl. 98: 48, Leipzig 1909.

APPENDIX: COMBINATIONES NOVAE IN FAMILIA LYCOPODIACEARUM

Diphasium C. PRESL

- Diphasium decurrens* (R. BR.) HOLUB, comb. nova. — Bas.: *Lycopodium decurrens* R. BROWN Prodr. Fl. Nov. Holland. 1: 165, Londini 1810.
- Diphasium gayanum* (REMY ap. C. GAY) HOLUB, comb. nova. — Bas.: *Lycopodium gayanum* REMY apud C. GAY Historia Fisica Politica Chile, Bot., 6: 545, Paris 1853.
- Diphasium heterophyllum* (SPRENG.) HOLUB, comb. nova. — Bas.: *Lycopodium heterophyllum* WILLDENOW ex SPRENGEL Syst. Vegetab. 4: 13, Gottingae 1827.
- Diphasium holtonii* (UNDERW. et LLOYD) HOLUB, comb. nova. — Bas.: *Lycopodium holtonii* UNDERWOOD et LLOYD, Bull. Torrey Bot. Club 33: 123, New York 1906.
- Diphasium lindseaceum* (SPRING) HOLUB, comb. nova. — Bas.: *Lycopodium lindseaceum* SPRING, Flora 21: 180, Regensburg 1838.

Lycopodiella HOLUB

- Lycopodiella bigelowii* (TUCKERMANN) HOLUB, comb. nova. — Bas.: *Lycopodium bigelowii* TUCKERMANN, Amer. Journ. Sci. Arts 45: 47, New Haven 1843.

Palhinhaea AMARAL FRANCO et CARVAL. VASCONCELLOS

- Palhinhaea brevibracteata* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium brevibracteatum* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg, Ser. 2, 24: 5, 1917.
- Palhinhaea capillacea* (SPRING) HOLUB, comb. nova. — Bas.: *Lycopodium capillaceum* WILLDENOW ex SPRING, Flora 21: 165, Regensburg 1838.
- Palhinhaea convoluta* (PAL. BEAUV.) HOLUB, comb. nova. — Bas.: *Lepidotis convoluta* PALISOT BEAUVOIS Prodr. Aéthéogam., 108, Paris 1805.
- Palhinhaea eichleri* (FÉE) HOLUB, comb. nova. — Bas.: *Lycopodium eichleri* GLAZIOU ex FÉE Cryptogam. Vascul. Brésil 2: 96, tab. 106, fig. 4, Paris 1873.

- Palhinhaea mariana* (WILLD.) HOLUB, comb. nova. — Bas.: *Lycopodium marianum* WILLDENOW Spec. Plant. 5: 31, Berolini 1810.
- Palhinhaea pendulina* (W. J. HOOK.) HOLUB, comb. nova. — Bas.: *Lycopodium pendulinum* W. J. HOOKER Icon. Plant. 1, tab. 90, London 1837.
- Palhinhaea polycephala* (COLENZO) HOLUB, comb. nova. — Bas.: *Lycopodium polycephalum* COLENZO, Transact. Proceed. New Zealand Inst. 27 (1894): 401, Wellington 1895.
- Palhinhaea salakensis* (TREUB) HOLUB, comb. nova. — Bas.: *Lycopodium salakense* TREUB, Annal. Jard. Bot. Buitenzorg 7: 141, Leiden 1888.
- Palhinhaea suffruticosa* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium cernuum* L. var. *suffruticosum* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg, Ser. 2, 24: 5, 1917. — Syn.: *Lycopodium suffruticosum* (ALDERW. ROSENB.) HERTER 1949.
- Palhinhaea tomentosa* (ALDERW. ROSENB.) HOLUB, comb. nova. — Bas.: *Lycopodium tomentosum* van ALDERWERELT van ROSENBURGH, Bull. Jard. Bot. Buitenzorg, Ser. 2, 24: 6, 1917.
- Palhinhaea trianae* (HIERON.) HOLUB, comb. nova. — Bas.: *Lycopodium trianae* HIERONYMUS, Bot. Jahrb. Syst. 34: 574, Leipzig 1905.

Pseudolycopodiella HOLUB

- Pseudolycopodiella affinis* (BORY) HOLUB, comb. nova. — Bas.: *Lycopodium affine* BORY Voyage Quatre Principal. Iles Mers Afrique 2: 204, Paris 1804.
- Pseudolycopodiella carnosus* (ALV. SILVEIRA) HOLUB, comb. nova. — Bas.: *Lycopodium carnosum* ALVARO SILVEIRA, Bolet. Commiss. Geogr. Geolog. Estado Minas Geraes 5/2: 119, tab. 7 et 8, 1898.

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SUMMARY

On the basis of differences in important characters (branching of the stem, spore-types, gametophyte-types etc.) the author accepts classification of *Lycopodiales* into two families — *Lycopodiaceae* and *Huperziaceae*. *Lycopodiaceae* in its restricted delimitation (with c. 100—130 species) may be divided into 10 genera; the evolutionarily more primitive family *Huperziaceae* (with c. 450 species) is monotypic. *Phlegmariurus* proposed in 1964 as a possible segregate of *Huperzia* has been revised from the viewpoint of its taxonomic qualification. The different habit of members of this taxonomic group links closely to those of various pendent epiphytes both with scarcely differentiated and undifferentiated strobiloids. The taxonomic repartition of the gametophyte-types *Selago* and *Phlegmaria* is hitherto insufficiently known, especially in groups whose taxonomic classification is questionable. Both spore-types show a certain regularity in their occurrence: the *Selago*-type is present mostly in evolutionarily primitive species groups and the *Phlegmaria*-type in evolutionarily progressive groups. However, the derived spore-type *Phlegmaria* occurs often in species very allied to primitive types within the genus and the *Selago*-type was found also in some evolutionarily rather derived species. Some data on chromosome numbers require revision as to whether they were in fact correctly counted. To accept the basic chromosome number ($x = 11$ for *Huperzia*, $x = 17$ for *Phlegmariurus*) as the only

classification criterion for the segregation of the two groups as genera causes the establishment of very unnatural units within *Huperzia* s.l. No one of the single main features discussed above gives a sound basis for classification of *Huperzia* s.l. into two or more genera. Also no more stable correlations between these characters have been stated. Therefore the author accepts the genus *Huperzia* BERNH. in a broader taxonomic circumscription. With regard to accepting *Huperzia* as a separate genus 203 new nomenclatural combinations are proposed for species transferred to it from *Lycopodium* (or described originally as members of the genera *Urostachys* or *Phlegmariurus*, respectively). An appendix is added containing 19 proposals of new nomenclatural combinations referring to species of *Lycopodiaceae* s. s. and made necessary by their generic reclassification. New combinations were proposed for species of genera *Diphasium* C. PRESL (5), *Lycopodiella* HOLUB (1), *Palhinhaea* AMARAL FRANCO et CARVAL. VASCONCELLOS (11) and *Pseudolycopodiella* HOLUB (2).

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