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A survey of the genus Hypoxis Linn in the Transvaal

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because it is found that when the plant is dried the anthers are inclined to twist and split longitudinally.

Among material examined belonging to the herbarium of the Transvaal Museum, certain sheets were found named tentatively by R.G.N. Young H. parvifolia Bak. or H. multiceps var. parva, a suggested new variety. These dwarf forms of H. multiceps had already been observed by the writer on the Witwatersrand and designated as a new variety of H. multiceps. They cannot be included in H. parvifolia because the anthers are complete at the apices, whereas those of H. parvifolia have deep apical fissures.

H. multiceps Buch. var. parva (nov. var.)

Corm oblong, ½" wide and up to 2" long, crowned with dense ring of long wiry bristles; roots up to 4" long, sparsely branched. Leaves 4-6, oblong or oblong-lanceolate, coriaceous, conspicuously and closely ribbed, 1½-2½" long at flowering time, ⅛" broad, with short, stellate hairs scattered over both surfaces and margin. Peduncles 2-3, 1½-3" long, covered with stellate hairs. Flowers 2, corymbose, pedicels ¼" long, bracts linear. Perianth limb ⅜" long and ¼" broad, segments oblong-lanceolate, the outer villose on the back; anthers lanceolate, deeply sagittate, 2½ lines long, filaments 1 line long, subulate, stamens 3 lines long; stigmas concrete, conical, style very short and broad, ovary obconic, densely villose, ¼" long.

DISTRIBUTION:

Transvaal: Irene (Pretoria), Jukskei River, Vaalhoek, Witwatersrand (Benoni, Witpoortjie, Johannesburg).

PLATE XVII. a. Habit photograph of H. multiceps and H. multiceps var. parva. Life size.

b. Inflorescence, x 1½.

XVI. HYPOXIS NELIANA SCHINZ.

Schinz in Vierteljahrsschr. Nat. Ges, Zurich. LXXI, 136,1926!

Corm subglobose, ⅜" in diameter, crowned with black

bristles; roots straight, sometimes sparsely branched, up to 1½" long. Leaves suberect, rigidly coriaceous, clothed with soft hairs, linear-lanceolate, acuminate, many nerves, two to three of which are more prominently thickened than the others, about 4" long, and 3 lines broad. Peduncles few, the same height as the leaves, the two flowers arising from the main axis at the same point, but the one pedicel being shorter than the other, bracts linear to lanceolate. Outer segments lanceolate, acute, clothed with yellowish-golden hairs on the outside, inner segments 4⅜ l. long and 1⅝ lines wide, both inner and outer segments slightly bearded at the apex; filaments broadly subulate ¾ line long, anthers 1½ lines long, sagittate at the bases and complete at their blunt apices; stigma concrete, massive triangular, style short and very broad at the base; ovary turbinate, hairy, ¼" long, bearing 15-20 ovules.

DISTRIBUTION:

Natal: Estcourt.

Transvaal: Dullstroom, Witwatersrand (Canada Junction, Witpoortjie).

AFFINITIES: H. neliana is related to H. rigidula Bak. and falls naturally into Nel's group, Rigidulae. It differs from H. rigidula, however, in the smaller size of the leaves and flowers, and the golden colour of the hairs. H. neliana corresponds very closely to a new species described by C.E. Moss in manuscript which he calls H. minor Moss. These specimens have been included in H. neliana Schinz.

PLATE XVIII. a. Habit photograph, life size.
b. Inflorescence, x 1½.

XVII. HYPOXIS INTERJECTA, NEL.

Nel in Engler's 'Bot. Jahrb.' 1914 !

Corm subglobose, about ¾" in diameter, crowned with black bristles. Leaves erect or suberect, coriaceous,

subacute or lanceolate-acute, 1⅛-2" long, and ⅜-½" broad. Peduncles few, short, densely hairy, 2-3 flowered, pedicels ⅜" long, bracts subulate, densely hairy on the outside, ¼" long. Exterior perianth segments lanceolate, acute, clothed on the outside with dense, ascending, stellate, gold hairs, the interior linear and obtuse, ⅜" long, and ¼" broad; stamens 3-3⅛ lines long, filiform filaments 2 lines long, anthers complete at the apex, deeply sagittate at the base 1½ lines long; stigmas large, concrete, conical, subsessile; ovary subglobose, densely hirsute.

DISTRIBUTION:

Trarsvaal: Lydenburg.

AFFINITIES: According to Nel this species resembles H. multiceps, but differs from it in that the filaments are filiform, whereas in H. multiceps the filaments are subulate.

XVIII. HYPOXIS LATIFOLIA, HOOK.

Hooker in Bot. Mag. t. 4817 !

Baker in Journ Linn. Soc. xvii, 115, 1878 !

Baker in Flora Capensis vi, 1896 !

Corm globose, 2½-3" in diameter, crowned with thick bristles; roots 2½ lines in width, up to 4" long. Leaves 6-8, lanceolate, rigidly coriaceous, strongly ribbed, entirely glabrous, finally 1½-2 ft. long, outer leaves very broad and short, median and longest 9" - 1½ ft. long and 1½ - 3" broad below at flowering time, margin entire or very minutely denticulate, sometimes purplish, apex rather acute, obtuse, or sometimes mucronulate. Peduncles slender, hairy, 3-4" long, raceme 10-12 flowered, 1½-2" long, very much flattened, and covered with appressed hairs; lower pedicels ¼-½" long, bracts linear, ⅜" long, hairy up the mid-line. Perianth limb ⅜" long, segments oblong, yellow, the outer greenish and hairy on the back; stamens 3 lines long, anthers lanceolate, sagittate, 2½ lines long, complete at the apex, filaments subulate 1 line long; stigmas concrete

conical, style very short and broad at the base, ovary turbinate, hairy, ¼" long.

DISTRIBUTION:

Natal:

Swaziland:

Transvaal: Johannesburg, Pretoria.

AFFINITIES: See H. colchicifolia, Bak.

PLATE XIX. a. Habit photograph, ⅛ natural size.

b. Inflorescence, x 1½.

XIX. HYPOXIS OLIGOTRICHA BAK.

Baker in Journ. Bot. p.3, 1889 !

Baker in Flora Capensis vi, 1896 !

Corm not seen. Leaves oblong-lanceolate, glabrous, erect, subcoriaceous, strongly ribbed, 10-18" long, 2-3" broad at the middle. Peduncles ancipitious, glabrous, 6-8" long. Flowers 10-15 in a lax raceme, 3-4" long, lower pedicels ½-¾" long, bracts linear, ¼-½" long. Perianth limb ⅜-¾" long, segments oblong-lanceolate, the outer with only a few scattered adpressed hairs on the back; stamens 4 lines long, anthers lanceolate, sagittate at the base, complete at the apex, 3½ lines long, filaments very short and broad, under a line in length; stigmas connate, conical, style very short and broad, ovary globose, almost glabrous, 1/6" long.

DISTRIBUTION:

Natal: Cramond, Durban, Greytown, Howick, Wentworth.

Cape Province:

Transvaal: Witwatersrand (by name only, specimen not seen).

AFFINITIES: Both Baker and Nel affirm that H. oligotricha is very closely related to H. Galpinii Bak. Baker quotes as the chief difference between the two species the fact that the ovary of H. oligotricha is glabrous, while that of H. Galpinii is hairy. This, however, is not invariably the case, and there seems to be intergrading forms exhibiting

varying degrees of hariness. C.E. Moss notes on a herbarium sheet that the ovary of the type specimen of H. oligotricha is not completely glabrous, as described by the author, but very sparsely hairy. Nel differentiates between the two on the grounds that in H. Galpinii the style is much longer than the stigma or equal in length to it, while in H. oligotricha the style is shorter than the stigma or absent. However, this is not the case. In both forms the style is shorter than the stigma, or, very rarely, equally long. It seems then, that there are no adequate grounds on which to separate H. oligotricha and H. Galpinii into two distinct species and H. Galpinii is therefore designated here as a variety of the older species, H. oligotricha.

H. oligotricha, Bak. var. Galpinii (var. nov.)

= H. Galpinii Baker in Flora Capensis vi, 1896 !

Corm not seen. Leaves lanceolate or oblong-lanceolate, erect, reaching above 12" in length and above 1" in width, strongly ribbed, slightly hairy. Peduncle very densely hairy, 6-8" long, raceme many-flowered, 3-4" long, pedicels short, ascending. Flowers as in H. oligotricha except that the ovary is more densely hairy.

DISTRIBUTION:

Transvaal: Barberton.

PLATE XX. a. Habit photograph, $\frac{3}{4}$ natural size. - -p

b. Inflorescence, x $1\frac{1}{2}$. - -p

c. Type sheet of var.

d. Inflorescence of var., x 1½

XX. HYPOXIS COSTATA, BAK.

Baker in Journ. Linn. Soc. xvii, 1878 !

Baker in Flora Capensis vi, 1896 !

Corm globose, $1\frac{1}{2}$-3" in diameter, crowned with a dense tuft of black fibres; roots straight, unbranched, contractile, up to $\frac{1}{4}$" broad and 4" long. Leaves 5-6, oblong or oblong-lanceolate, coriaceous, conspicuously and closely ribbed,

the outer leaves usually about 5" long, the inner up to 12" long at the time of flowering, often growing to 18" in length when the plant is in fruit, 1-1½" broad at the middle, densely ciliated with long hairs on the margin and keel beneath, otherwise glabrous. Peduncles 1-2, as long as the leaves, densely hairy; flowers 4-7 racemose, lower pedicels very short; bracts linear, villose. Perianth limb ½-¾" long, the outer segments densely hairy on the back; stamens 3½ lines long, anthers lanceolate, sagittate, complete at the apex 3 lines long, filaments short, broadly subulate, 1 line long, stigmas concrete, massive, conical, style very short or absent, ovary obconic, densely hairy, ¼" long.

DISTRIBUTION:

Cape Province: Katberg, Tembuland, Vryburg.

Natal: Giant's Castle, Mooi River.

O.F.S.: Bethlehem, Kroonstad, Nelson's Kop.

Basutoland: Leribe.

Swaziland:

Transvaal: Ermelo, Frankenwald, Haenertsburg, Heidelberg, Kaalfontein, Lydenburg, Middleburg, Pietersburg, Piet Retief, Pretoria, Wakkerstroom, Warmbaths, Witwatersrand (Canada Junction, Houghton Estate, Bedford Farm, Milner Park, Morningside, Witpoortjie).

HABITAT: Very common in all grassveld.

AFFINITIES: A well-defined species.

PLATE XXI. a. Habit photograph, ⅓ natural size.
b. Inflorescence, x 1½.

XXI. HYPOXIS PATULA, NEL.

Nel in Engler's 'Bot. Jahrb.' 1914 !

Corm oblong, 1-1½" in diameter, clothed with black bristles from the old leaves. Leaves 8-10, suberect, coriaceous, completely clothed with white hairs, linear, acute, 8-nerved, nerves approximately equally thickened, 4-5" long, and ⅜-½" broad. Peduncles few, 5½-6" long, with the flowers

subsessile; inflorescence racemose, 1½-2" long, bracts setose-subulate ¼" long. External perianth segments linear, acute, densely covered with ascending bristly hairs on the outside, ⅜" long, and ⅛" broad, the interior segments suboblong, obtuse; stamens 3 lines long, anthers lanceolate, sagittate at the base, complete at the apex 2 lines long, filaments subulate, 1½ lines long; stigmas concrete 1 line long, style ½ line long, ovary turbinate, densely covered with ascending bristly hairs.

DISTRIBUTION:

Transvaal: Barberton.

XXII. HYPOXIS ROOPERII MOORE.

Moore in Gard. Comp. 1, 65.

Lemaire in Jard. Fleur. t. 303.

Baker in Journ. Linn. Soc. xvii, 118, 1878 !

Baker in Flora Capensis vi, 1896 !

Corm globose, 1½-3½" in diameter, crowned with a ring of bristles, often exuding copious brown jelly; roots straight, very stout, unbranched, contractile, up to 8" in length. Leaves 12-18, to a corm, lanceolate, acuminate, markedly tritichous in arrangement, firm in texture, glabrous on the upper surface when mature, shortly hairy on the back and margin, under 12" long and ⅜" broad at the time of flowering, afterwards 1-2 ft. long. and 1-1½" broad in the lower half. Peduncles 2-4, 9-12" long, ancipitous, hairy upwards, flattened. Flowers 4-10, racemose, lower pedicels ½-1" long, bracts linear. Perianth limb ½-¾" long, rarely more, segments oblong, the outer hairy all over the back; stamens large and conspicuous in the open flower, 5 lines long; anthers lanceolate, deeply sagittate, filaments subulate 2¼ lines long; stigmas concrete, style short or absent, ovary turbinate ¼" long, densely villose. Capsule turbinate, densely villose, ½" long, circumscissile round the middle. Seeds small, round, spherical, black and shiny.

DISTRIBUTION:

Cape Province: Coldstream, Katberg, Kentani, Kingwilliamstown, Kokstad, Komgha, Mount Currie, Port Alfred, Queenstown, Umtata.

Natal: Botha's Hill, Eshowe, Greenwood Park, Greytown, Inanda, Mooi River, Pietermaritzburg, Umgeni.

O.F.S.: Bloemfontein, Glen, Kroonstad, Rietfontein, Senekal.

Basutoland: Leribe.

Transvaal: Barberton, Bethlehem, Bloemhof, Carolina, Ermelo, Frankenwald, Heidelberg, Houtbosch, Klip River, Louis Trichard, Middleburg, Modderfontein, Nylstroom, Pienaar's River, Potcherstroom, Pretoria, Rustenberg, Ventersdorp, Woodbush, Witwatersrand (very common throughout).

VARIETY:

H. Rooperii Moore var. Forbesi Bak.

Baker in Flora Capensis vi, 1896 :

A dwarf form with the leaves hairy on the margins and keel beneath, and a shorter perianth.

DISTRIBUTION:

Cape Province: Kentani.

O.F.S.: Glen.

Transvaal: Barberton, Bethlehem, Carolina, Heidelberg, Middleburg, Nylstroom, Rustenberg, Pretoria, Warmbaths.

Note: R.G.N. Young (in M.S.) suggests that a new species is formed by hybridisation between H. Rooperii and H. costata. His material in support of this theory, however, belongs quite clearly to H. Rooperii var. Forbesi. Nel, incidentally ignores the existence of this variety in his monograph.

PLATE XXII. a. Habit photograph, ½ life size.

b. (a) viewed from above.

c. Inflorescence, x 1½.

XXIII. HYPOXIS OBTUSA, BURCH.

Burchell in Bot. Reg. tab. 159 !

Roem. et Schultes, Syst. Veg. vii, 765.

Baker in Trans. Linn. Soc. XXIX, 156 !

Baker in Journ. Linn. Soc. vol. xvii, p. 114, 1878 !

Baker in Flora Capensis vi, 1896 !

Baker in Flor. Trop. Afr. vii, 1898 !

Corm 1½-2½" in diameter, sometimes slightly longer than wide, densely bristly with the remnants of old foliage at the crown; roots straight, unbranched, contractile, up to 6" in length. Leaves 8-12, fasciculate, linear, less often lanceolate, acuminate, firm in texture, strongly ribbed, hairy, especially on the margins and keel beneath, 9-12" long at flowering time, finally a foot or more long and ½-¾" broad, the outer often twisting in a distinctive spiral fashion. Peduncles hairy, slender, shorter than the leaves, very much flattened; raceme 3-11 flowered, usually 6-flowered; lower pedicels up to ⅜" long; bracts linear. Perianth limb ½-¾" long, segments elliptically oblong, obtuse, yellow, the outer narrower with a small subpubescent point, densely hairy on the back, the inner deflectent at each side; stamens large and conspicuous, 5 lines long, anthers lanceolate, sagittate, complete at the apex, 4 lines long, filaments subulate, 2 lines long; stigmas concrete, conical, style equal in length to the stigmas or much shorter; ovary turbinate, densely bristly, ¼" long. Capsule turbinate, densely hairy, circumscissile round the middle. Seeds small, round, black and shiny.

DISTRIBUTION:

Cape Province: Aliwal North, Amatola Mountains, Molteno.

Natal: Drakensburg, Mooi River, Utrecht, Zululand.

O.F.S.: Bethlehem, Bloemfomtein, Rietfontein.

Transvaal: Barberton, Carolina, Konigsberg, Lydenburg, Pretoria, Springbok Flats, Waterval Boven, Waterval Onder, Wolmaransstad, Witwatersrand (frequent throughout).

HABITAT: Usually found in dry, often stony places, either flat or sloping, often in very tall grass. Reported as poisonous from the Transvaal and Rhodesia, where it is said to have caused bovine staggers.

VARIETY: Nel creates a new variety,

H. obtusa var. chrysotricha, Nel, in which the leaves are much longer, and the perianth segments covered with golden hairs. Transvaal forms have been observed with longer leaves, but the hairs on the segments were not a decided gold. The writer has not seen the type specimen of this new variety, and was therefore unable to name these specimens with any degree of certainty.

PLATE XXIII. a. Habit photograph, ⅓ life size.
b. Inflorescence, x 1⅓.

XXIV. HYPOXIS RIGIDULA, BAK.

Baker in Journ. Linn. Soc. xvii, p. 116, 1878 !
Baker in Flora Capensis vi, 1896 !

Corm usually 3" long and 1½" wide, crowned by dense, black fibres; roots straight, unbranched, contractile, up to 6" in length. Leaves 5-6, linear, rigidly coriaceous, strongly ribbed, usually with 2-3 veins more prominently thickened, erect, shortly pilose, often 9-12" long at flowering time, subsequently extending to 3 ft. in length, 1/6 - ⅓" broad. Peduncles 2-3, usually about a foot long, slender, shortly pilose; flowers 3-10, racemose; pedicels all short and hairy; bracts linear. Perianth limb ⅜-½" long, segments oblong-lanceolate, yellow, the outer densely pilose on the outside, the inner with a few hairs down the centre on the outside; stamens 3¾ lines long, the anthers lanceolate, sagittate, complete at the apex, 3 lines long, the filaments broadly subulate 1½ lines long; stigmas concrete, conical, style shorter than stigmas or absent; ovary turbinate, ¼" long, clothed with dense, long, whitish, bristly hairs. Capsule

turbinate, densely villose, ¼" long. Seeds round, small, light, black.

DISTRIBUTION:

Cape Province: Alexandria, Bathurst, Boschberg, Cathcart, Coldstream, Grahamstown, Jansenville, Kei Mouth, Kentani, Kokstad, Maclear, Mount Coke, Mount Currie, Phillipstown, Queenstown, Somerset.

Natal: Durban, Gourton, Greytown, Inanda, Lidgetton, Mooi River, Muden, Richmond, Utrecht, Van Reenen's Pass, Zululand.

O.F.S.: Clarence, Heilbron, Kroonstad, Senekal.

Basutoland: Emans.

Transvaal: Barberton, Benoni, Belfast, Bethal, Carolina, Ermelo, Frankenwald, Godwan River, Haenertsberg, Heidelberg, Kaalfontein, Lake Chrissie, Lichtenburg, Middleburg, Nylstroom, Magaliesberg, Piet Rétief, Pretoria, Potchefstroom, Pietersburg, Rustenberg, Sabie, Standerton, Ventersdorp, Warmbaths, Witbank, Witwatersrand (frequent throughout) Wonderfontein, Zoutpansberg.

HABITAT: Very common on flat or sloping grasslands in dry areas. Frequent in newly burnt veld, or land turned once by the plough.

VARIETY:

H. rigidula Bak. var. pilosissima Bak.

Baker in Flora Capensis vi, 1896 !

Leaves, peduncles and perianth shaggy with denser, longer hairs, more silky and whitish-grey in colour.

DISTRIBUTION:

Natal: Gourton, N. coast, Tugela district.

Swaziland:

Transvaal: Barberton, Frankenwald, Houtbosch, Magaliesberg, Pietpotgietersrust, Pretoria, Rustenberg, Warmbaths, Waterval Boven, Witwatersrand (frequent throughout).

PLATE XXIV. a. Habit photograph, young plant in early spring, ½ life size.
b. In mid-summer, ½ life size.
c. Inflorescence, x 1½.

XXV. HYPOXIS CORDATA, NEL.

Nel in Engler's 'Bot. Jahrb.' 1914 :

Corm globose, about 2" in diameter, clothed with white bristles. Leaves 12-16, erect, rigidly coriaceous, subglabrous or sparsely clothed with white hairs above, white-fimbriate underneath on the veins and margins, linear, acuminate, 18-20 nerved, of which two are distinctly thickened, 15-20" long and about ¼" wide. Peduncles few, short, 8-10" long, of which the 6-8 flowered inflorescence occupies about 2", flowers subsessile, bracts linear-subulate. Perianth limb about ½" long, the external segments linear, acute, densely white-hairy on the outside, the internal ovate; stamens 2½ lines long, filaments subulate 1 line long, anthers linear, basifixed, complete at the apex, sagittate at the base 2 lines long; stigma subsessile, oblong, concrete, ovary clavate, densely villose. Capsule oblong, splitting round the neck; seeds subglobose, black.

DISTRIBUTION:

Transvaal: Shilowane, Modderfontein.

AFFINITIES: It is difficult to credit the existence of a species so very closely related to H. rigidula Bak. and yet not included in that very plastic species. Nel separates H. rigidula from H. cordata on the width of the leaves. Only the field observer can realise what a grave risk is being run, since the leaf size in H. rigidula is very unstable, varying with the rainfall, light intensity, age of the plant, season etc. However, H. cordata must be accepted as a species until the type sheet can be examined.

XI. CONCLUSIONS.

This survey has demonstrated very clearly the many problems which arise in connection with the systematics of Hypoxis, and the great necessity which exists that these anomalies be cleared up, and the genus thoroughly revised. When dealing with only twenty-five species out of a genus consisting of about a hundred species, the writer must proceed with the utmost caution. No generalisations can be made as to the phylogenetic relationships or geographical migrations of these forms until the entire genus has been reviewed. If this contribution is of any assistance in the compilation of a complete and comprehensive monograph of the genus it has achieved its object.

XII. SUMMARY.

The genus Hypoxis is described in general with regard to distribution, history, affinities, morphology and ecology. A key is given to the Transvaal species, with descriptions of 25 species and 7 varieties. The previous descriptions are amplified and amended. One new species and two new varieties are described.

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