

HYPECOUM PENDULUM L. (PAPAVERACEAE) IN AUSTRALIA—A NEW INTRODUCTION

by

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SUMMARY

The discovery of the introduced weed *Hypocoum pendulum* L. (sensu lato) at Lake Boga, Victoria, is described. This appears to be the first record of any species of *Hypocoum* naturalized in Australia. A taxonomic account of *Hypocoum pendulum* and closely related taxa is given.

OCCURRENCE

On 29 September 1970 *Hypocoum pendulum* L. (sensu lato) was collected by T. W. Donaldson from the property of E. R. Mitchell (allotment 10, section 2, parish of Kunat Kunat) approximately 2.5 km direct line west north west of the township of Lake Boga, in northern Victoria. Lake Boga is between Kerang and Swan Hill. The collection had flowers and early fruits, and the species was growing wild over several acres of a wheat crop. On 11 December 1970 W. J. Anderson collected material with ripe fruits from the same locality. Both collectors are officers of the Vermin and Noxious Weeds Destruction Board, Victorian Department of Crown Lands and Survey, and forwarded their collections (KTRS 222/70; KTRS 320/70) through the Keith Turnbull Research Station to the National Herbarium of Victoria for identification. Specimens are retained at MEL. This is apparently the first record of any species of *Hypocoum* naturalized in Australia.

The species was not noted in the district during 1971 and 1972, but in 1973 a second infestation of *Hypocoum* was found in a sandy, windblown, roadside area and adjacent cropland. This was approximately 4.5 km direct line west of Lake Boga Township along the Lake Boga to Goschen road and about 2.5 km west south west of the 1970 locality. Material gathered in 1973 from this second site was not retained at the National Herbarium. However, the species is persisting and further material (flowers and developing fruits 30 September and 1 October 1975; immature to mature fruits 19 November 1975) has been collected by W. J. Anderson from both sites. Specimens are lodged in the National Herbarium of Victoria, Melbourne; State Herbarium of South Australia, Adelaide; National Herbarium of New South Wales, Sydney; Herbarium Australiense, Canberra; Western Australian Herbarium, Perth.

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Hypecoum pendulum is native to the Mediterranean regions of southern Europe and northern Africa, and to south-west Asia (islands in the Mediterranean sea; Portugal; Spain; southern France; Italy; Yugoslavia; Greece; Bulgaria; Rumania; Turkey; Lebanon; north Arabian desert; Iran; Afghanistan; Pakistan; Southern Russia—regions of the Black and Caspian Seas north to about Stalingrad and from the Caspian Sea east to Tashkent, Lake Balkash and Altai; Morocco; Algeria; Tunisia; Tripoli; Egypt—Mediterranean coast). In these regions it flowers from March or April to May or June, and is recorded from cultivated land, fallow fields, grazing lands, waste and weed-infested places, sandy and clayey-stony deserts and clayey, rocky or rarely sandy foothill slopes, often in arid or semi-arid areas.

Within the British Isles species of *Hypecoum* have occurred casually on a number of occasions, following accidental introduction of seed, but they have failed to naturalize themselves. For example Druce (1908) recorded three species including *H. pendulum* L. as being of casual occurrence but not completely established in Britain. These casual occurrences of *Hypecoum* spp. have apparently originated from seed present as impurities amongst imported crop seeds or crop screenings (Brewer, 1863, p. 313; Dunn, 1905, p. 10–11; Salisbury, 1964, p. 137–8).

The origin of *H. pendulum* in the Lake Boga district is unknown. Paddocks at the Mallee Research Station, Walpeup, which supplies wheat seed to the Lake Boga district, have been searched but the species has not been found there (the manager, pers. comm., 18 Dec. 1975). Its appearance on cultivated and on waste land in open country with a comparatively warm dry climate is consistent with the habitat and climatic preferences recorded in its native countries. The species could spread locally and also extend to other agricultural areas of south-eastern Australia.

TAXONOMIC NOTES

In Willis (1973) *Hypecoum* is placed in the monotypic family Hypecoaceae which is noted as "almost exactly intermediate between Papaveraceae (s. str.) and Fumariaceae." Current floras either accept this (Täckholm, 1974) or place the genus in Papaveraceae (Cullen, 1966) or in Papaveraceae subfamily Hypecoideae (Cullen, 1965; Maire, 1964; Howat and Tutin, 1964; Popov, 1937 transl. 1970). The genus consists of glabrous annual (rarely biennial) plants some 15–40 cm high and has distinctive flower and fruit characters—sepals 2; petals 4, in 2 dissimilar, alternate whorls; outer petals entire to shallowly 3-lobed; inner petals deeply trisected with the two lateral lobes entire and the median lobe consisting of a slender stalk bearing a recurved, broadly expanded, mostly fringed apex; stamens 4, opposite the petals; ovary superior, of 2 carpels but 1-celled,

with a bipartite stigma; fruit an elongated capsule bearing seeds in one longitudinal row and disarticulating (if at all) transversely into 1-seeded sections (rarely dehiscent in 2 valves). Full descriptions can be found in the floras mentioned, particularly Popov l. c.

H. pendulum L. (1753), *H. parviflorum* Kar. & Kir. (1842) and *H. trilobum* Trautv. (1884) are all characterised by their mature fruits being pendulous and born on recurved pedicels. The fruits are straight or rarely slightly curved, compressed-tetragonal in transverse section, and are of the transversely disarticulating type. *H. parviflorum*, described from the area of Lake Balkhash in southern Russia, apparently occurs from Altai west to the eastern side of the Caspian Sea and in Pakistan, Afghanistan, Iran and Egypt (rarely; mediterranean coastal region), i.e. in the eastern sector of the range of *H. pendulum*. Popov (1937, transl. 1970) states that "the geographical boundary between *H. parviflorum* and *H. pendulum* has not been precisely determined." *H. trilobum*, described from Turkmenia, is apparently confined to Iran, Afghanistan and a small adjoining portion of southern Russia, from the south-east region of the Caspian Sea east to about Tashkent, i.e. like *H. parviflorum* it occurs in the eastern sector of the range of *H. pendulum*. The supposed distinctions between the three species are:—

H. pendulum (s. str.)—Corolla pale yellow, small; outer petals entire, narrower than those of *H. parviflorum*, almost twice as long as wide; stigmatic branches short, divergent; fruit not (or only with difficulty) disarticulating into segments, the epidermis not peeling off.

H. parviflorum—Corolla pale yellow, small; outer petals obscurely 3-lobed, to 7 mm long x 5 mm broad; stigmatic branches short, usually not divergent; fruit disarticulating (sometimes with difficulty), the epidermis peeling off the fruit body.

H. trilobum—Corolla bright yellow, large; outer petals 3-lobed, 15 (–20) mm broad; stigmatic branches long, to 2 (–4) mm, divergent; fruit not (or only with difficulty) disarticulating, the epidermis not peeling off.

The distinctions refer to variable characters. Popov (1934) indicates that intermediates between *H. trilobum* and *H. parviflorum* are frequent. He states that *H. parviflorum* is very difficult to distinguish from *H. pendulum* and should probably be considered only as a variety or geographical race of *H. pendulum*. Krylov (1931) reduced *H. parviflorum* to subspecific rank as *H. pendulum* ssp. *parviflorum* (Kar. & Kir.) Krylov. Cullen (1966) treats *H. trilobum* and *H. parviflorum* as varieties of *H. pendulum* (var. *trilobum* (Trautv.) Cullen; var. *parviflorum* (Kar. & Kir.) Cullen) and states that "Intermediates between var. *pendulum*

and var. *parviflorum* are very frequent; var. *parviflorum* is only slightly distinguished from var. *pendulum* and does not seem worth specific recognition."

The *Hypocoum* material collected at Lake Boga in 1970 was not critically examined until dissected by the present author in May 1975 and recognised as a member of the variable *H. pendulum* group. A specimen was then sent to T. G. Tutin, University of Leicester, U.K., co-author of the account of *Hypocoum* given in *Flora Europaea*, with a request for his opinion. Tutin replied (pers. comm., 2 June 1975) that the collection ". . . is certainly *H. pendulum* L. The correlation between lobing of the outer petals, flower size and strongly recurved pedicels and pendulous fruits is not at all good and *H. trilobum* and *H. parviflorum* have, I think correctly, been treated simply as varieties of *H. pendulum* by J. Cullen in *Flora Iranica* (1966). Your specimens appear to combine the lobed outer petals of var. *trilobum* with the small flowers of var. *parviflorum*, a combination of characters that does not seem to have received taxonomic recognition."

A description of the plant, based on the Australian material and prepared by the present author is:—

Plant annual, glabrous, with a slender tap root. *Leaves* to 10 (–15) cm long, glaucous, radical, forming an erect to spreading rosette; petiole about one third to one half of the leaf length, slender, ca 0.5–1 mm broad, narrowly winged at the base; blade oblong in outline but deeply and finely divided with multiple-bisected segments arising alternately along the rhachis; rhachis very slender, appearing as a continuation of the petiole; bisections ca 0.25–0.5 mm broad, the distal ones apiculate. *Stems* several per plant, decumbent to ± erect, extending well beyond the leaves, smooth cylindrical, narrow, to 30 (–60) cm long, forking at intervals of 2–10 (–15) cm, 1–2 mm broad in the lower portions but more slender above (almost filamentous when in flower), leafless except where the stem forks and/or a pedicel arises and there bearing short reduced leaves. *Pedicels* born singly, each arising from the fork of a stem or else terminally, very slender and almost filamentous when in flower, lengthening and thickening in fruit and then ca 0.5–2 cm long x ca 1 mm thick, somewhat expanded under the fruit, and strongly recurved. *Sepals* 2, ovate, acute, 2–2.5 mm long. *Petals* 4, in two dissimilar, alternate whorls. *Outer petals* 2, yellow, ca. 9–10.5 mm long x 10–11.5 mm broad, distally shallowly 3-lobed, the 2 lateral lobes each a little broader than the median lobe and projecting laterally in a dentate shape, the median lobe directed distally, all lobes obtuse. *Inner petals* 2, ca 8 mm long and 5–6 mm broad at the summit, deeply 3-lobed, the lobes equalling about three fifths of the petal length, the petal with a small claw at the base; lateral lobes each ca 1.5–2 mm wide, ± parallel-sided, slightly falcate outwards, obtuse-rounded at apex, yellow with several scattered, purplish, oblong spots; middle lobe as long

as or very slightly shorter than the lateral lobes, yellow, and consisting of a slender stalk (basal two fifths of the lobe length) bearing a broad-oblong expansion at its apex, the expansion fringed on the edges, emarginate and recurved. *Stamens* 4, opposite the petals, ca 6.5 mm long; filament ca 4.5 mm long x 0.5 mm broad, flattened, tapered at the apex into a short, slender connective; anther ca 1.5 mm long, basifixed, 2-celled, linear, the cells splitting along lateral, longitudinal slits, each anther cell with a minute apical projection; filaments and anthers yellow, the filaments with several purple, oblong spots similar to

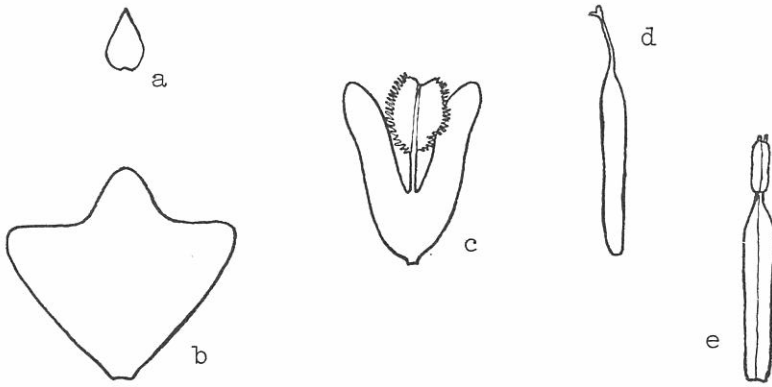


Fig 1.—*Hypocoum pendulum* L. (sensu lato); a—sepal, x 3; b—outer petal, x 3; c—inner petal, x 3; d—gynoceium, x 5; e—stamen, x 5. From KTRS 222/70 (MEL).

those on the lateral lobes of the inner petals. *Ovary* superior, slender, with a slender style bearing two very short divergent stigmas at the apex; stigmas and style extending just beyond the petals. *Ripe fruit* an elongated capsule 4–6 cm long, narrowly fusiform in outline and 2.5–4 mm wide at the broadest part, \pm rectangular in transverse section with a prominent raised longitudinal nerve down the midline of each of the broader sides of the rectangle, sometimes also with a nerve on each of the narrower sides; capsule straight to slightly curved, pendulous from the apex of the recurved pedicel, hard, not readily disarticulating but if so then breaking transversely into 1-seeded articles. *Seeds* in one longitudinal row and apparently > 10 per capsule, grey, 2–2.5 mm long, somewhat compressed, obliquely semicircular in outline.

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REFERENCES

- Brewer, J. A. (1863)—Flora of Surrey. (van Voorst; London).
- Cullen, J. (1965)—*Hypecoum* L. in Davis, P. H. (edit.) Flora of Turkey 1: 236–238. (University Press: Edinburgh.)
- (1966)—Papaveraceae in Rechinger, K. H. (edit.) Flora Iranica No. 34. (Akademische Druck—u. Verlagsanstalt: Graz, Austria.)
- Druce, G. C. (1908)—List of British plants. (Clarendon Press: Oxford.)
- Dunn, S. T. (1905)—Alien fora of Britain. (West, Newman and Co.: London.)
- Krylov, P. (1931)—Flora zapodnoi Sibiri 6: 1230–1231 (Tomsk).
- Maire, R. (1964)—Flore de l'Afrique du North II. Encyclopédie Biologique 63. (Paul Lechevalier: Paris.)
- Mowat, A. B. and Tutin, T. G. (1964)—*Hypecoum* L. in Flora Europaea 1: 251–252. (University Press: Cambridge.)
- Popov, M. G. (1934)—Exsiccatae: Herbarium Florae Asiae Mediae Fasc. 23: exs. no. 560 *Hypecoum parviflorum* and 561 *Hypecoum trilobum*. (from Universitate Asiae Mediae.)
- (1937, translated 1970)—Papaveraceae B. Juss. in Komarov, V. L. (edit.) Flora of the U.S.S.R. 7: 437–549. (Israel Program for Scientific Translations: Jerusalem.)
- Salisbury, E. (1964)—Weeds and Aliens. 2nd ed. New Naturalist series. (Collons: London.)
- Täckholm, V. (1974)—Students' flora of Egypt. 2nd ed. (University: Cairo.)
- Willis, J. C. (1973)—A dictionary of the flowering plants and ferns. 8th ed., revised by H. K. Airy Shaw. (University Press: Cambridge.)