

A REAPPRAISAL OF *HYPECOUM PENDULUM* AND *H. PARVIFLORUM*
(HYPECOACEAE)

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ABSTRACT

Hypecoum pendulum & *H. parviflorum* complex is reviewed and their interrelationships are discussed. The proper status and delimitation of the two species are made with the help of pollen morphology and SEM studies of spermoderm of the seeds.

The genus *Hypecoum* L. is placed in the family Papaveraceae by Engler and Diels (1936), Fedde (1936), Melchior (1964) and Thorne (1983) as a subfamily Hypecoideae. But Cronquist resolved the situation by defining the order Papaverales as consisting of two families, the Papaveraceae and the Fumariaceae. He was of the opinion that the Asian genera *Hypecoum* and *Pteridophyllum* may form a connecting link between the two families and he placed this subfamily Hypecoideae under the family Fumariaceae. Hutchinson (1959) and Dahlgren (1975) also placed it under the family Fumariaceae. But Takhtajan (1966) raised this subfamily to the family status Hypecoaceae for the first time.

The genus *Hypecoum* is characteristically different from other genera of the family Papaveraceae due to the absence of milky juice, presence of only four stamens instead of numerous stamens and tripartite inner petals. It is also seen that the genus *Hypecoum* is also different from the members of the family Fumariaceae in having regular flowers with tripartite inner petals. Whereas in the Fumariaceae the flowers are zygomorphic and the stamens are arranged in bundles opposite to the inner petals, each

bundle has a single filament which divides into 3 parts at the apex and the central part has 2-loculed anther and the lateral part with one loculed anther. While in the genus *Hypecoum* the stamens are 4 in number and the anthers are 2-loculed. Treatment of this genus as a separate family Hypecoaceae and family and generic descriptions can be found in Debnath & Nayar (1984).

In India the genus is represented by 3 species *Hypecoum leptocarpum* Hook. f. et Thoms., *H. pendulum* Linn., *H. parviflorum* Kar. et Kir. There are controversies regarding the proper status and delimitation of the later two species (*Hypecoum pendulum* and *H. parviflorum*). So an attempt has been made to analyse the taxonomic disposition of *Hypecoum pendulum-parviflorum* complex.

GEOGRAPHIC DISTRIBUTION

Hypecoum pendulum Linn. is described from Southern France (Provence) and this species 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 in the Black and

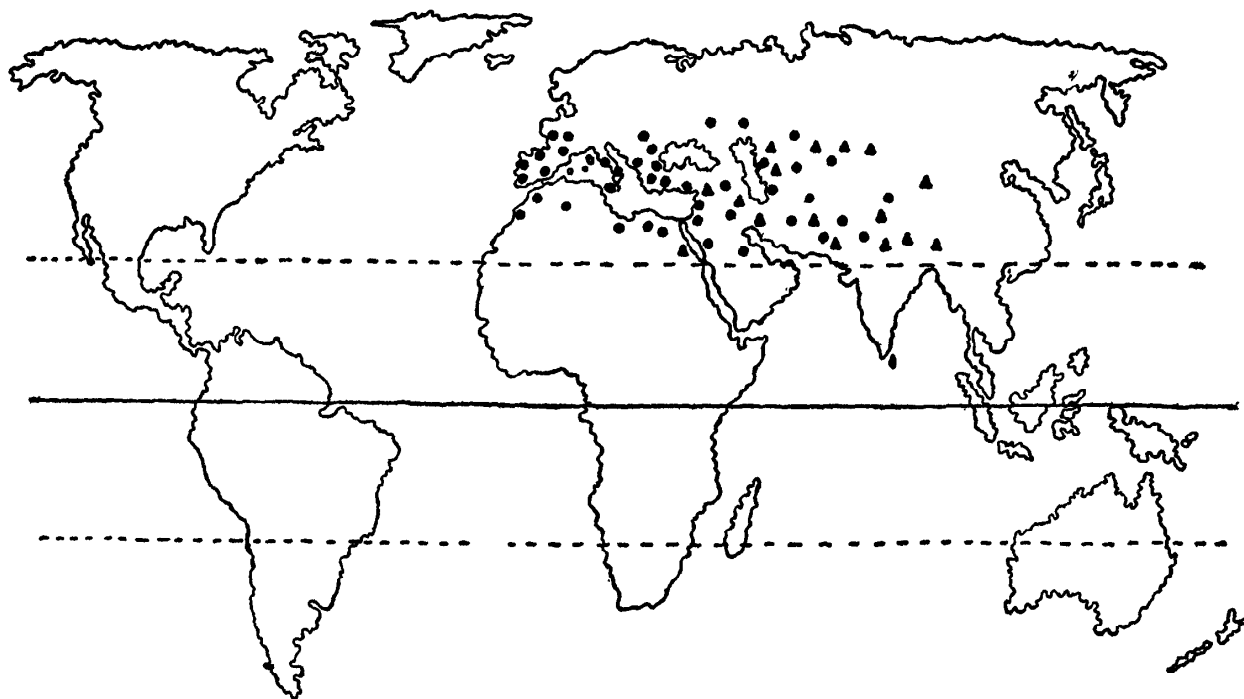
Caspian seas north to about Stalingrad and from the Caspian sea coast to Tashkent, Lake Balkash and Altai, Morocco, Algeria, Tunisia, Tripoli, Egypt-Mediterranean coast (Aston, 1976)]. In India it was reported by Singh (1975).

H. parviflorum Kar. et Kir. is originally described from the area of Lake Balkash in southern Russia, and occurs from Altai west to the eastern side of the Caspian sea and in eastern or Chinese Turkestan, Turkey, Iran, Afghanistan, Egypt, India and Himalaya.

So the distribution of *H. parviflorum* is in the eastern sector of the range of *H. pendulum* (Map 1).

Krylov (1931) reduced *H. parviflorum* to subspecific rank as *H. pendulum* ssp. *parviflorum* (Kar. & Kir.) Krylov. Popov (1934) indicates that "*H. pendulum* is a vicariad and *H. parviflorum* is very difficult to distinguish from *H. pendulum* and should be considered only as a variety or geographical race of *H. pendulum*."

Cullen (1966) treated *H. parviflorum* as a variety of *H. pendulum* and stated that "Intermediates between var. *pendulum* and var. *parviflorum* is only slightly distinguished from var. *pendulum* and does not seem worth specific recognition". Jafri et Qaiser (1974) stated "Intermediates between var.



Popov (1937, transl. 1970) stated "the geographical boundary between *H. parviflorum* and *H. pendulum* has not been precisely determined".

TAXONOMIC NOTE

Hypocoum pendulum and *H. parviflorum* are very near to each other. In a word, it is very difficult to distinguish them. Fedde (1909, p. 97) mentioned a note for *Hypocoum parviflorum*—"An modo varietas *H. penduli*?"

pendulum and var. *parviflorum* are very frequent, especially in fruit characters, therefore, *H. parviflorum* does not deserve more than a varietal rank"

On the basis of the characters of outer petals, stigmatic branches, fruits and presence of glands at the base of the filaments the earlier workers have segregated the two taxa from time to time.

The character of the outer petals of the two taxa is a contrasting one.

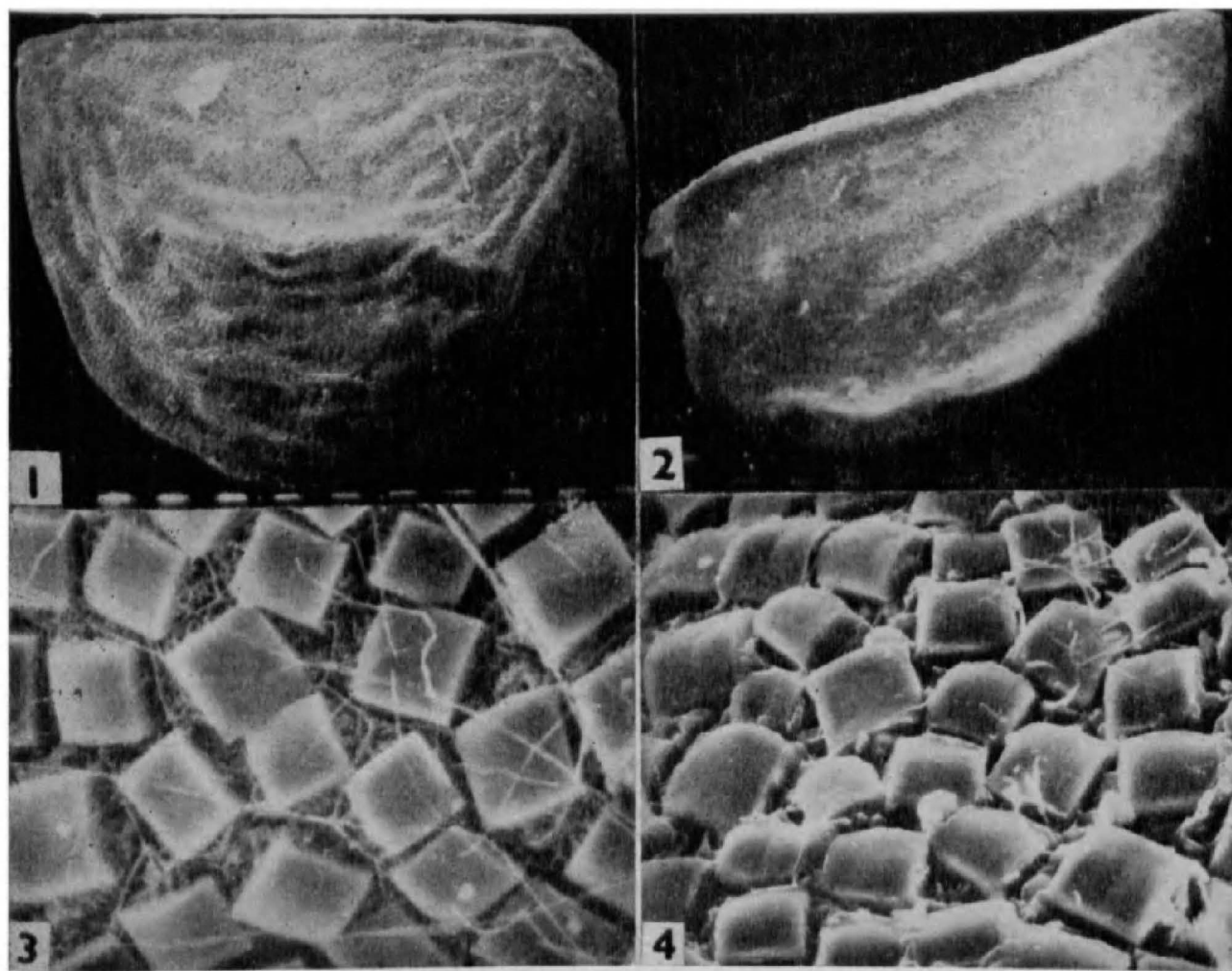
Fedde (1909), Cullen (1966), Jafri et Qaiser (1974) stated that outer petals of *Hypocoum pendulum* are rhomboid, subtrilobed to trilobed whereas *H. parviflorum* it is elliptic and entire. But Mowat & Tutin (1964), Cullen (1965), Popov (1937, transl. 1970), Aston (1976) stated that outer petals of *H. pendulum* are entire, without a trace of lobes whereas *H. parviflorum* is obovate or oblong, obscurely 3-lobed [Popov (1937, transl. 1970), Aston (1976)].

Moreover Cullen (1966) reduced *H. parviflorum* as a variety of *H. pendulum* and segregated the two varieties by the following key.

Fruit indehiscent, outer petal ± entire ovate-rhomboid	.. var. <i>pendulum</i>
Fruit pseudodehiscent, epidermis segments with one persistent seed, outer petal entire	.. var. <i>parviflorum</i>

But besides the character of the outer petal, it does not correspond as supported by Jafri et Qaiser (1974).

Lastly the absence of glands at the base of the stamen filament in var. *parviflorum* as mentioned by Jafri et Qaiser (l.c.) does not seem worth recognition, because after careful examinations it was found that both the taxa *parviflorum* and *pendulum* possess glands.



Figs. 1-4 : 1. *Hypocoum pendulum* var. *parviflorum*. SEM photograph of a seed showing planoconvex shape $\times 200$. 2. *H. pendulum* var. *pendulum*. SEM photograph of a seed showing planoconvex shape $\times 225$. 3. *H. pendulum* var. *parviflorum*. Part of the surface of a seed showing single stranded thin fibres in the space between the flat discrete bodies (SEM) $\times 3600$. 4. *H. pendulum* var. *pendulum*. Surface part of a seed showing beads in the space in between the discrete bodies (SEM) $\times 3600$.

PRESENT OBSERVATION

After careful observation of the specimens of both *H. parviflorum* and *H. pendulum*, it was found that the characters (particularly lobation of the outer petal) by which the different authors (mentioned above) segregated the two taxa, are confusing and intermixing.

Though the two taxa are somewhat close to each other, yet, a few morphological characters, palynological observations and spermoderm of the seed ornamentations show the differentiation between them. But such characters are not sufficient to separate *parviflorum* from *H. pendulum* as a species and taxa *parviflorum* may be treated as a variety of *H. pendulum*.

The differentiating characters of *H. pendulum* var. *pendulum* and *H. pendulum* var. *parviflorum* are as follows :

Morphology : *H. pendulum* var. *parviflorum* differs from var. *pendulum* by siliques disarticulating and epidermis peeling off, whereas in var. *pendulum* siliques articulating and epidermis not peeling off.

Palynology : Palynologically the species *H. pendulum* characterised by pollen grains 2 & 3 zonocolpate, spheroidal to prolate in shape, length $\times$ breadth = $24-32 \times 24-26\mu$; polar diameter $26-32\mu$. Colpi $22-27\mu$ long and 2.5μ broad. Exine $\pm 2.0\mu$ thick, sexine $\pm 1.0\mu$ thick, tectate or intectate, suprategal processes spinulose, surface pattern striato-reticulate, nexine $\pm 0.5\mu$ thick.

H. pendulum var. *pendulum* differs palynologically from var. *parviflorum* in having tectate pollen grains and suprategal processes spinulose, whereas in var. *parviflorum* the grains are intectate.

Spermoderm of the seed : In the species *H. pendulum*, the seeds are planoconvex (Figs. 1 & 2) and spermoderm of the seeds are characterised by the presence of discrete

bodies which are square or rectangle in shape. The upper surface of those bodies may be flat (in var. *parviflorum*) or convex (in var. *pendulum*) and the space in between such bodies contain single stranded thin fibres in var. *parviflorum* (Fig. 3) or thick strands which project upward in the shape of beads in var. *pendulum* (Fig. 4).

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