

TWO NEW SPECIES OF *PAPAVER* L. (PAPAVERACEAE) FROM KASHMIR HIMALAYA, INDIA

GH. HASSAN DAR¹, TABINDA RASHID², A. R. NAQSHI³,
ANZAR A KHUROO⁴ AND AKHTAR H MALIK⁵

^{1,4,5}, Centre for Biodiversity and Taxonomy (CBT), University of Kashmir, Hazratbal,
Srinagar-190 006, Jammu & Kashmir, India.

², Ex-Research Scholar, CBT; ³, Ex-Reader, CBT, University of Kashmir, Hazratbal,
Srinagar-190 006, Jammu & Kashmir, India.

Corresponding author. Prof. G.H. Dar; Email: profdar99@gmail.com

Abstract

While revising the genus *Papaver* L. (Papaveraceae) occurring in the Kashmir Himalaya, two new species – *P. kachroianum* Tabinda, Dar & Naqshi, and *P. pamporicum* Tabinda, Dar & Naqshi are described and illustrated. *P. kachroianum* is allied to *P. lacerum* Popov, but differs in its long-tipped leaf-lobes, oblong-ovate flower buds, bright-red or crimson petals, and 8-10 stigmatic rays. *P. pamporicum* resembles *P. dubium* L., but can be separated by its simple, erect stem; erect, sub-appressed leaves; smaller flowers; and cruciform petals, which are smaller and bright-orange. A key for all the species of *Papaver* reported from Kashmir, incorporating the new species, is also provided.

Introduction

Papaveraceae, the Poppy family, has been a part of human civilization from times immemorial by virtue of ornamental value of poppies, their utility in medicine, and as narcotics and hallucinogenic agents. The family was first established by A.L.de Jussieu (1789) and contained a diverse group of genera, including *Papaver*, *Fumaria*, *Hypecoum*, *Argemone*, *Bocconia*, and *Glaucium*. The first major account of the family on world basis was given by A.P. de Candolle (1824). Bentham and Hooker, f. (1862) recognized four subfamilies in it: Papaverae, Eupapaverae, Hunnemanniae, and Fumariae; some of these, at least, were later separated as independent families, e.g. Fumariaceae (Cronquist, 1981). Based on the evidence of morphology and nucleotide sequence data, many modern workers, however, consider the broadly-circumscribed poppy family (Papaveraceae s. l.) as a monophyletic taxon with several subfamilies (Thorne, 1974, 1992; Takhtajan, 1980; Kadereit, 1993; Kadereit *et al.*, 1994, 1995, 1997; Hoot and Crane, 1995; Jud *et al.*, 2002). In all, this family contains 40 genera with 770 species (Jud *et al.*, 2002); the two major genera being *Papaver* and *Corydalis*.

The genus *Papaver* L. with 100 species is distributed the world over, mainly centered in the central and southern parts of Europe to the temperate Asia, some species occur in Americas and Oceania, and one found in S. Africa. A heterogeneous genus, *Papaver* has been divided into as many as 11 sections (Kadereit, 1988). From India, Debnath and Nayar (1993) reported 6 species of *Papaver*. Majumder (2002) reported 5 species from the Jammu and Kashmir State.

Our studies on *Papaver* in Kashmir Himalaya, however, revealed 9 species, including *P. kachroianum* and *P. pamporicum* described in this paper as two new species. The new species are based on the study of specimens collected recently from the Kashmir Valley. These specimens did not match with any of the known species of *Papaver*, as ascertained by the study of all material of the genus present in the herbarium of Kashmir University (KASH), and by the scrutiny of relevant literature (Hooker, 1872; Blatter,

1927; Coventry, 1927; Mowat & Chater, 1964; Stewart, 1972; Jafri & Qaiser, 1974; Polunin & Stainton, 1984; Debnath & Nayar, 1993; Majumdar, 2002; Zhang *et al.*, 2008).

Papaver kachroianum Tabinda, Dar & Naqshi sp. nov. (Fig. 1 A-C)

Diagnosis: *Papaver lacerum* Popov affinis, sed foliolobis in longe apices terminantibus; alabastris oblongo-ovatis; petalis vivide rubris vel carmesinis et stigmatibus 8 – 10, differt et *Papaver macrostomum* Boiss. et *Papaver rhoeas* L. aliquant affinis, sed seminibus paucis (vel nil) differt.

Holotypus: North-west Himalaya, Kashmir, Srinagar District, Umar Colony, Lal Bazar, 1600 m, along vegetable fields, petals bright-red or crimson, 10.6.2002, *Tabinda Rashid* 027 (KASH).

Annual herb; stem erect, 55-90 cm high, sparsely branched, with densely-spreading, whitish, 1-3 mm long hairs, except on peduncles which are appressed-hairy. Leaves sessile, 3.5 - 6 cm long, pinnatisect; lobes linear-lanceolate, dentate, hairy, terminating into long tips. Peduncles erect, 12-20 cm long, with 1-2 mm long appressed hairs. Flower-buds oblong-ovate, 1-1.2 x 0.4-0.5 cm, with spreading, broad-based, whitish bristles. Flowers solitary terminal, 4.5-5.5 cm in diam. Sepals 2, caducous, with spreading hairs. Petals 4 (2+2), obovate-suborbicular, 2.5-3.5 x 3-5.5 cm, bright-red or crimson, with a small, black, basal blotch. Stamens numerous, very small, 3 - 4 mm long; anthers linear-lanceolate, c. 0.5 mm long, apiculate. Capsule subglobose, 0.5-1cm long, broad at top, narrowed towards base with a short stipe, glabrous, smooth. Stigmatic rays 8-10. Seeds few, or none, minute.

Additional specimens studied: Kashmir, Srinagar District, Lal Bazar, *Tabinda Rashid* 025, 026, 028 (KASH).

Etymology: The specific epithet is in honour of the late Prof. P. Kachroo, a well-known Indian botanist who headed the Department of Botany, University of Kashmir for about two decades.

Flowering and Fruitng: May-July.

Distribution: Presently known only from Srinagar in Kashmir Valley of Jammu & Kashmir.

Note: *Papaver kachroianum* closely resembles *P. lacerum* Popov, but can be recognized by long-tipped leaf-lobes, oblong-ovate flower buds, bright red or crimson petals, and 8-10 stigmatic rays. It also resembles *P. macrostomum* Boiss. in having appressed hairs on peduncle, and in petal number, colour and position; it's spreading white hairs, foliage dissections, and capsule structure may indicate some resemblance with *P. rhoeas* L. The new species, however, differs from both these species in having a few (or no) seeds in the capsule.

Papaver pamporicum Tabinda, Dar & Naqshi sp. nov.(Fig. 1 D - F)

Diagnosis: *Papaver dubium* L. affinis, sed caulibus simplicibus, erectis; foliis erectis, subappressis; floribus brevioribus, ad 2.2 cm in diam., petalis cruciformibus, brevioribus, vivide aurantiacis differt.

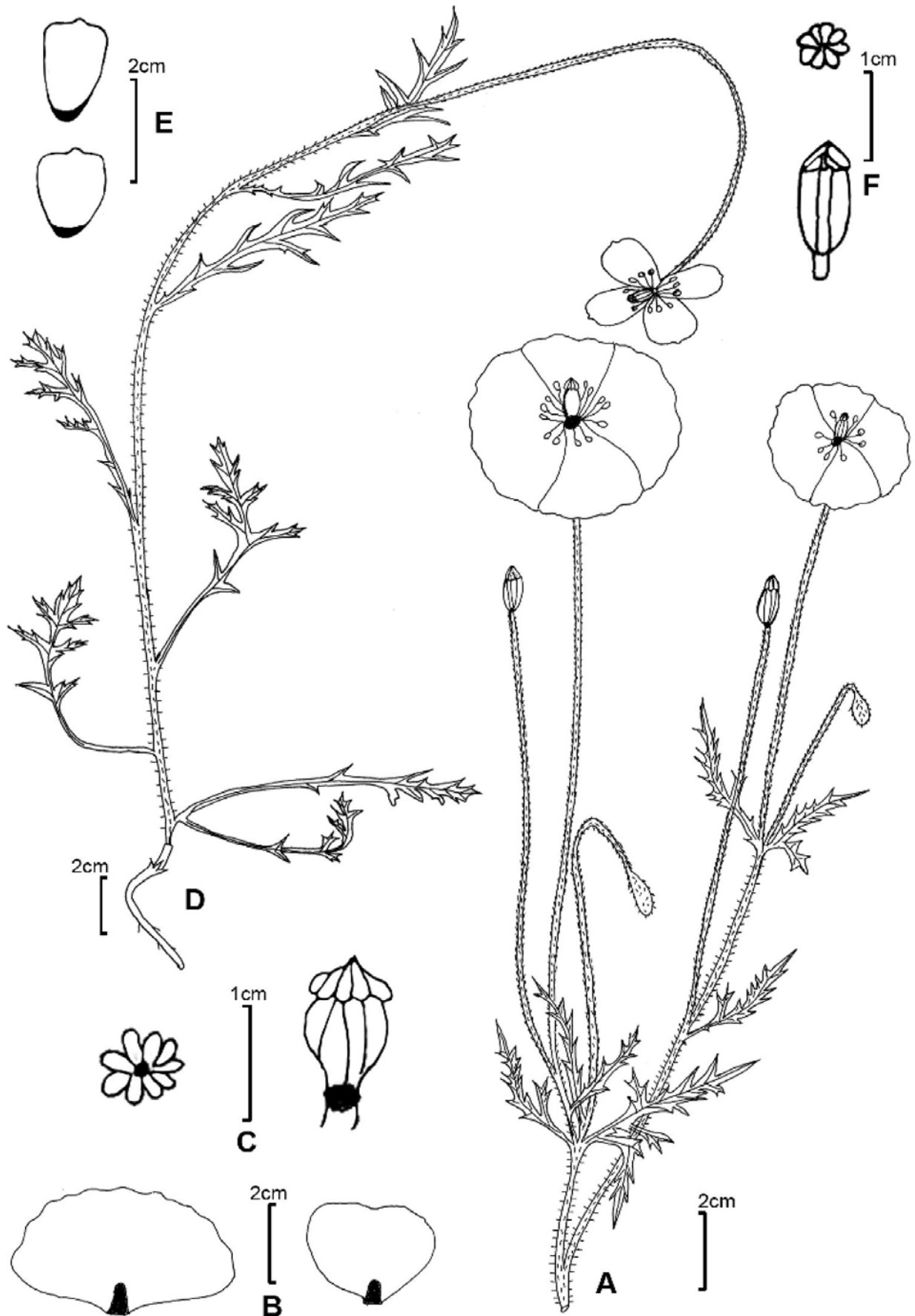


Fig. 1. *Papaver kachroanum*: A, flowering branch; B, petals; C, capsule and stigmatic disc. *Papaver pamporicum*: D, habit; E, petals; F, capsule and stigmatic disc.

Holotypus: North-west Himalaya, Kashmir, Srinagar District, Hazratbal, Kashmir University Botanical Garden (KUBG), 1600 m, to the west of Coniferatum, in association with *Papaver dubium*, 15.4.2002, *Tabinda Rashid* 007 (KASH).

Annual herb; stem erect, 12 - 42 cm high, unbranched, with spreading, 1 - 2 mm long hairs, except on peduncles which are appressed-hairy. Leaves linear-lanceolate, 1 - 5.5 x 0.3-1.5 (-1.7) cm, pinnatifid; lobes entire to dentate, hairy, terminating in a 1 mm long bristle; upper leaves sessile, lower petiolate; petiole (0.8-)1 - 2.5 cm long. Peduncle erect, 7 - 18.5(-23) cm long, with 1 - 2 mm long, appressed hairs. Flowers solitary terminal, 2 - 2.2 cm in diam. Sepals 2, caducous. Petals 4, cruciform, oblong-obovate, 0.9 - 1.5 x 0.3 - 1 cm, bright orange-red, caducous. Stamens numerous; filaments as long as the ovary, 4 - 6 mm long, slender; anthers c. 0.5 - 1 mm long, broad-elliptic. Capsule sessile, ovate-oblong, 0.4 - 1 x 0.2 - 0.5 cm, narrowed towards base, glabrous, not distinctly ribbed; stigmatic rays 4-7, falling a little short of lobed margin of the disc. Seeds reniform, 0.3 - 0.5 mm, light-brown, reticulate.

Additional specimens studied (paratypes): Kashmir, Srinagar District, Kashmir University Campus, Hazratbal, 1600 m, 02 Apr. 2002, *Tabinda Rashid* 002 (KASH); *ibid.*, 16 Apr. 2002, *Tabinda Rashid* 012 (KASH); *ibid.*, 18 Apr. 2002, *Tabinda Rashid* 013, 014, 015 (KASH); *ibid.*, 20 Apr. 2002, *Tabinda Rashid* 021 (KASH); *ibid.*, 04 May 2002, *Tabinda Rashid* 022 (KASH); Pampore, saffron fields, in association with *Tulipa stellata*, *T. lanata*, and *Papaver macrostomum*, etc., 09 May 2002, *Tabinda Rashid* 024 (KASH).

Etymology: The specific epithet is after the place 'Pampore'- an area in the vicinity of Srinagar (Kashmir Valley) famous for the specific saffron (*Crocus sativus* L.) fields, wherefrom the species has mostly been collected.

Flowering and Fruitng: April-June

Distribution: Presently known only from Srinagar and Pampore area in Kashmir Valley of Jammu & Kashmir.

Notes: *Papaver pamporicum* is allied to *P. dubium* L., but can be differentiated by its simple erect stem; erect, ± sub-appressed leaves; smaller flowers; and cruciform petals, which are smaller and bright-orange. It also resembles in some characters with *P. decaisnei* Hochst. & Steud. ex Boiss. Its hybrid origin from *P. dubium* and *P. decaisnei* is, however, unlikely here, because *P. decaisnei* does not occur anywhere in close vicinity of this region.

Key to the species of *Papaver* reported from Kashmir

- 1 + Plants perennial 2
- Plants annual, rarely perennating 3
- 2 + Cauline leaves absent; peduncle bristly-hairy; flower-buds ovoid-orbicular; flowers ebracteate; 2-5 cm across; capsule roughly setose; stigmatic-rays 7-8 ...
..... *P. nudicaule*
- Cauline leaves present; peduncle appressedly-hairy; flower-buds oblong-ovoid; flowers bracteate, 10-15 cm across; capsule glabrous; stigmatic-rays 14 20
..... *P. bracteatum*

- 3 + Cauline leaves amplexicaul, coarsely dentate; peduncle glabrous, rarely with few hairs; petal margins wavy; capsule large, 5 - 6 cm across *P. somniferum*
 - Cauline leaves not amplexicaul, deeply lobed; peduncle hairy, rarely glabrous; petal margins usually not wavy; capsule up to 2 cm across 4
- 4 + Peduncle with spreading hairs; flowers 5 - 10 cm across; stigmatic-rays 9-15 *P. rhoeas*
 - Peduncle with appressed hairs; flowers up to 7 cm across; stigmatic-rays up to 10 5
- 5 + Petals cruciform, without any basal blotch *P. pamporicum*
 - -Petals 2+2, not cruciform, each with a black basal blotch 6
- 6 + +Flower-buds ellipsoidal; capsule covered with yellow, sub-spreading or recurved hairs *P. hybridum*
 - -Flower-buds ovate, ovate-oblong to oblong-ovate; capsule glabrous 7
- 7 + .+Flower-buds ovate, apiculate; petals bright orange-red; anthers without apical appendage; capsule distinctly ribbed *P. dubium*
 - Flower-buds ovate-oblong to oblong-ovate, not apiculate; petals bright red-crimson; anthers with apical appendage or apiculate; capsule obscurely ribbed 8
- 8 + Flower-buds 1-2.5 cm long, 0.6-1cm broad; capsule oblong-ellipsoidal; stigmatic-rays 5-10, keeled *P. macrostomum*
 - - Flower-buds 1-1.2 cm long, 0.4-0.5 cm broad; capsule sub-globose; stigmatic-rays 8-10, not keeled *P. kachroianum*

Acknowledgements

The help for the Latin diagnosis of the new species by Dr. V. J. Nair, Scientist Emeritus, Southern Circle of BSI, Coimbatore, and Dr. Christensen, University of Copenhagen, Natural History Museum of Denmark, Botanical Garden and Museum, Copenhagen, is gratefully acknowledged. Thanks are also due to Mr. Aijaz Hassan Ganie, Research Scholar, for his help with illustrations.

References

- Bentham, G. and J.D. Hooker. 1862. *Genera Plantarum*. Vol. 1. Weldon and Wesley, Ltd. And Verlag Von J. Gramer, New York.
- Blatter, E. 1927. *Beautiful Flowers of Kashmir*. Vol. I. John Bale Sons & Danielsson, Ltd., London, pp. 28-29.
- Candolle, A.P. de (Ed.). 1824. *Prodromus Systematis Naturalis Regni Vegetabilis, I. Treuttel et Wurtz, Paris*, pp.117-124.
- Coventry, B.O. 1927. *Wild Flowers of Kashmir*. Series II. Raithby, Lawrence and Co., Ltd., London, pp. 19-20.
- Cronquist, A. 1981. *An Integrated System of Classification of Flowering Plants*. Columbia University Press, New York.
- Debnath, H.S. and M.P. Nayar. 1993. Papaveraceae. In: Sharma, B. D. and N. P. Balakrishnan (Eds.), *Flora of India 2*: 1-33. *Botanical Survey of India*, Kolkata, India.
- Dhar, U. and P. Kachroo. 1983. *Alpine Flora of Kashmir Himalaya*. Scientific Publishers, Jodhpur, India, pp. 81.
- Hooker, J. D. 1872. *Flora of British India*. Vol. I. L. Reeve & Co., London.
- Hoot, S.B. and P.R. Crane. 1995. Interfamilial relationships in the Ranunculidae based on molecular systematics. *Plant Syst. Evol. Suppl.*, 9: 119-131.

- Jafri, S.M.H. and M. Qaiser. 1974. *Papaver* L. In: Nasir, E. and S. I. Ali (Eds.), *Flora of West Pakistan*, 61: 26-30. PARC, Islamabad, Pakistan.
- Jud, W.S., C.S. Campbell, E.A. Kellogg, P.F. Stevens and M.J. Donoghue. 2002. *Plant Systematics: A Phylogenetic Approach*. Ed. 2. Sunderland, MA: Sinauer, New York.
- Jussieu, A.L. de. 1789. *Genera Plantarum Secundum Ordines Naturales Disposita*. Apud Viduam Herissant et Theophilum Barrois, Paris.
- Kadereit, J. W., F. R. Blattner, K. B. Jork and A. Schwarzbach. 1994. Phylogenetic analysis of the Papaveraceae s. l. (incl. Fumariaceae, Hypecoaceae and *Pteridophyllum*) based on morphological characters. *Bot. Jahrb. Syst.*, 116 (3): 361-390.
- Kadereit, J.W. 1988. Sectional affinities and geographical distribution in the genus *Papaver* L. (Papaveraceae). *Beitr. Bio. Pflanzen.*, 63: 139-156.
- Kadereit, J.W. 1993. Papaveraceae. In: Kubitzki, K. (Ed.), *The Families and Genera of Vascular Plants, vol. 2 (Magnoliid, Hamamelid and Caryophyllid Families)*: 494-506. Springer, Berlin.
- Kadereit, J.W., A. Schwarzbach and K.B. Jork. 1997. The phylogeny of *Papaver* s. l. (Papaveraceae): Polyphyly or monophyly? *Pl. Syst. Evol.*, 204: 75-98.
- Kadereit, J.W., F.R. Blattner, K.B. Jork and A. Schwarzbach. 1995. The phylogeny of the Papaveraceae sensu lato: morphological, geographical, and ecological implications. In: Jensen, U. and J. W. Kadereit (Eds.), *Systematics and Evolution of the Ranunculiflorae*, pp. 133-145. Springer, Vienna. [*Plant Syst. Evol. Suppl.* 9].
- Majumder, S. C. 2002. *Papaver* L. In: Singh, N. P., D. K. Singh and B. P. Uniyal (Eds.), *Flora of Jammu & Kashmir*, 1: 469-473. Botanical Survey of India. Kolkata, India.
- Mowat, A. B. and A. O. Chater. 1964. *Papaver* L. In: Tutin, T. G., V. H. Heywood, N. A. Burges, D. H. Valentine, S. M. Walters and D. A. Webb (Eds.), *Flora Europaea*, vol. 1. Cambridge University Press, UK.
- Polunin, O. and A. Stainton. 1984. *Flowers of the Himalaya*. Oxford University Press, New Delhi, India, pp. 28-30.
- Stewart, R. R. 1972. An Annotated Catalogue of the Vascular Plants of West Pakistan and Kashmir. In: Nasir, E. and S. I. Ali (Eds.), *Flora of West Pakistan*, 286-288. Fakhri Press, Karachi.
- Takhtajan, A. 1980. Outline of the Classification of Flowering Plants (Magnoliophyta). *Bot. Rev.*, 46: 225-359.
- Thorne, R. F. 1974. A phylogenetic classification of the Annoniflorae. *Aliso*, 8: 147-209.
- Thorne, R. F. 1992. Classification and geography of the flowering plants. *Bot. Rev.*, 58: 225-348.
- Zhang, M.-L., Z.-Y. Su and M. Liden. 2008. *Papaver* L. In: Wu, Z.-Y., P. H. Raven and D.-Y. Hong (Eds.), *Flora of China*, 7 (Menispermaceae through Capparaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis, USA.