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Cover: Rufous-headed Hornbill *Rhabdotorrhinuswaldeni* © Philip Godfrey C. Jakosalem.



NOTE

***Tribulus ochroleucus* (Maire) Ozenda & Quezel (Zygophyllaceae) - a new addition to the flora of India**

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The Foundation for Revitalisation of Local Health Tradition (FRLHT) is an NGO that is recognized as Centre of Excellence (CoE) for Medicinal plants and Traditional Knowledge used in Indian Systems of Medicine by the Ministry of Environment and Forest (MoEF), Government of India, New Delhi. As part of this project, National Herbarium of Medicinal Plants used in Indian System of Medicine (ISM) was established. To accomplish the mission of the national herbarium, in-house botanical team undertakes field survey in various bio-geographic zones of the country to collect medicinal plants and house them in FRLHT herbarium (FRLH). As part of this program, surveys were undertaken in Sirohi, Chittorgarh, Ajmer, Jaisalmer, Bikaner, and Pokhran Districts of Rajasthan to collect semi-arid region specific species. One *Tribulus* species collected during the survey was not matching to any of the State floras published by Sharma & Tiagi (1979), Singh (1983), Shetty & Pandey (1983), Bhandari (1990), Shetty & Singh (1987, 1991, 1993), Singh & Singh (2006), and Tiagi & Aery

(2007). Later, after a thorough scrutiny with Ghafoor (1974), Maire (1933); Ahmad & Mohamed (2005), and referring the herbarium specimens of Dr. R.C.J.E. Maire in central Sahara, 1939 (catalogue no. MPU367347) it was identified and confirmed as *Tribulus ochroleucus* (Maire) Ozenda & Quezel. There are 42 collections of *Tribulus ochroleucus* (Maire) Ozenda & Quézel on GBIF, collected from Niger, Libya, Algeria, Iran, and Saudi Arabia from the year 1928 to 2006. Therefore, it forms a new record to India, collected for the first time from Rajasthan. Hence it is provided here with the correct name, description, specimens examined, phenology, distribution, notes, and ecology.

The voucher specimens are deposited at the Foundation for Revitalisation of Local Health Traditions Herbarium (FRLH), Bengaluru. As far as genus *Tribulus* is concerned, Thomas (2006) mentions that there are six species and one variety occurring in India whereas Singh & Singh (1997) reported five species and two varieties for India.

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***Tribulus ochroleucus* (Maire) Ozenda & Quezel**

in Ozenda, Quézel. In: Trav. L'Inst. Recherches Sahariennes 14: 74. 1956. (Zygophyllaceae).

Type: Sahara centralis, Mouydir Oued Arak, Maire 284.

Tribulus macropterus var. *ochroleucus* Maire in Ozenda, Quézel. Trav. L'Inst. Recherches Sahariennes 14: 74. 1956.

T. ochroleucus var. *perplexans* (Maire) Ozenda & Quézel in Ozenda, Quézel. Trav. L'Inst. Recherches Sahariennes 14: 75. 1956.

T. macropterus subsp. *serolei* Maire in Diagn. Pl. Orient. 1: 161 1843.

Herbs decumbent, semi-erect or erect. Stems many, terete, pilose, arising from the rootstock. Leaves 2.5–4 cm long, opposite, unequal, the larger one with seven pairs of leaflets, the smaller one with 5 pairs of leaflets. Leaflets 4–8 x 1.5–3 mm, sessile or subsessile, oblique, oblong-ovate, acute, densely villous beneath, sparingly pubescent or glabrous when

mature on upper surface. Stipules 3–4 x 0.5–1 mm, ovate to linear, densely pilose. Buds ovoid, densely silvery villous. Flowers axillary to solitary; pedicels 5–15 mm long, sparsely to densely villous. Sepals 5, ovate-lanceolate, subequal, 4–6 x 1–2 mm, acute, villous outside, pubescent inside. Petals 5, broadly obovate to ovate, truncate at apex, glabrous, yellow; stamens 8–10; filaments ca. 2.5 mm long; anthers ca. 1 mm long, ovate-oblong, yellow. Ovaries ca. 1 mm long. Styles sessile or subsessile, ca. 1 mm long, cylindrical; stigma pyramidal. Schizocarps breaking into 4–5 mericarps, 4–5 subequally lobed, up to 7 mm across, densely hispid, with many long white hairs and many scattered short white hairs, devoid of spines or wings, pyramidal-ovoid. (Image 1).

Specimen examined: 117458 (FRLH), 19/8/2014, Near Harchand Kidani on SH-65, Jaisalmer District, Rajasthan, 26.388 N, 71.803 E, alt. 236 m, coll. K. Ravikumar, N. Balachandran & Umeshkumar Tiwari.

Flowering: August; Fruiting: September–October.



A



B



C



D



E



Herbarium No. 117458 (FRLH)	
Date:	19/8/2014
Collector:	K. Ravikumar
Altitude:	236 m
Herbarium No.:	117458
Family:	Zygophyllaceae
Species:	<i>Tribulus ochroleucus</i>
Subspecies:	<i>ochroleucus</i>
Flowering:	Aug
Fruiting:	Sept-Oct
Notes:	Decumbent, semi-erect, densely hairy, flowers yellow, petals 5, stamens 8–10, mericarps 4–5, pyramidal-ovoid, densely hispid, with many long white hairs and many scattered short white hairs, devoid of spines or wings, pyramidal-ovoid.
Reference:	K. Ravikumar, N. Balachandran & Umeshkumar Tiwari

Image 1. A—*Tribulus ochroleucus* (Maire) Ozenda & Quezel—Habitat | B—Habit | C—Flower | D–F—Different views of mericarps | G—Voucher specimen. © K. Ravikumar.

Global Distribution: Afghanistan, Algeria, Chad, Djibouti, Ethiopia, India (northwestern Rajasthan), Iran, Libya, Mali, Mauritania, Niger, northern Africa, Oman, Pakistan, Palestine, Sinai, Somalia, Sudan, and Yemen.

Ecological notes: This plant is found associated with herbs such as *Aristida hystricula* Edgew., *Bergia capensis* L., *Boerhavia erecta* L., *Cenchrus* sp. *Cistanche tubulosa* (Schenk) Wight ex Hook.f., *Cleome brachycarpa* Vahl ex DC., *Cleome pallida* Kotschy, *Cleome gynandra* L., *Cyperus arenarius* Retz., *Dactyloctenium scindicum* Boiss., *Digera muricata* (L.) Mart., *Dipcadi erythraeum* Webb & Berthel., *Enneapogon elegans* (Nees ex Steud.) Stapf, *Euploca rariflora* (Stocks) Diane & Hilger., *Fagonia schweinfurthii* (Hadidi) Hadidi, *Farsetia hamiltonii* Royle, *Glinus lotoides* L., *Heliotropium strigosum* var. *brevifolium* (Wall.) C.B.Clarke, *Indigofera linnaei* Ali, *Kohautia aspera* (B.Heyne ex Roth) Bremek., *Mollugo cerviana* (L.) Ser., *Phyllanthus* species, *Polygala abyssinica* R.Br. ex Fresen., *Portulaca oleracea* L., *Pulicaria crispa* (Forssk.) Oliv., *Solanum albicaule* Kotschy ex Dunal, *Tribulus alatus* Drège ex C.Presl, *Tribulus terrestris* L., and *Zygophyllum simplex* L.

Other associated trees and shrubs include *Calotropis procera* (Aiton) W.T. Aiton, *Capparis decidua* (Forssk.) Edgew., *Leptadenia pyrotechnica* (Forssk.) Decne., *Prosopis cineraria* (L.) Druce, *Salvadora oleoides* Decne. and *Ziziphus* sp.

Tribulus ochroleucus (Maire) Ozenda & Quezel is comparatively less common than *T. terrestris* L. It can be easily recognized in the field by its semi-erect habit and 4–5 subequally lobed schizocarps without any wings

or spines. It can be found growing in grey brown desert soil that is mixed with red and yellow soil. *T. ochroleucus* (Maire) Ozenda & Quezel is closely allied to *T. mollis* Ehrenb. ex Schweinf. but differs in entire plant and the fruit does not have prominently silky hair.

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