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Turcomilax (Taulimax) oli sp. n. from the Kumaun Himalaya, India (Gastropoda: Pulmonata: Limacidae)

With 1 map and 6 figures

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Abstract. Description of a new species. The discovery of *Turcomilax (Taulimax) oli* sp. n. in India results in considerable extension of the distribution range of both *Turcomilax* and the family Limacidae.

Kurzfassung. *Turcomilax (Taulimax) oli* sp. n. aus dem Kumaun Himalaya, Indien (Gastropoda: Pulmonata: Limacidae). – Beschreibung einer neuen Art. Der Fund von *Turcomilax (Taulimax) oli* sp. n. in Indien zeigt, daß die Verbreitung von *Turcomilax* und der Familie Limacidae weiter reicht als es vorher bekannt war.

Turcomilax has been recorded from Kirgiz and neighbouring regions in Central Asia (Tyan-Shan Mts, Dzhungarskiy Alatau, Tarbagatay Range). It is currently represented by 5 species grouped in three subgenera (LIKHAREV & WIKTOR 1980): *Turcomilax (Turcomilax) nanus* (SIMROTH, 1901), *Turcomilax (Turcomilax) ferganus* (SIMROTH, 1910), *Turcomilax (Michaelisia) natalianus* (MICHAELIS, 1892), *Turcomilax (Taulimax) turkestanus* (SIMROTH, 1898) and *Turcomilax (Taulimax) tzvetkovi* LIKHAREV et WIKTOR, 1980. The subgenus *Taulimax* has been known only from the Tyan-Shan Mts. The occurrence of a new species from India demonstrates that the geographical range of this group of slugs is substantially larger than hitherto supposed. Records of *Turcomilax* are restricted to high, scarcely explored, mountains and the genus may prove to be more abundant and widely distributed.

***Turcomilax (Taulimax) oli* sp. n.**

Holotype: Naina Peak, Nainital, Kumaun Himalayas, India (29°23' N, 79°28' E – see map 1, 2610 a.s.l., crystalline metamorphic rocks, oak forest. Leg. P. K. GUPTA and B. P. OLI, 20th September 1998. Museum of Natural History, Wrocław University (Poland) – No. MP 703.

Paratypes: 11 specimens collected with the holotype – 3 spec. The Natural History Museum, London (United Kingdom) – No. 19990399/1-3; 3 spec. Kumaun University, Nainital (India); 3 spec. Museum of Natural History, Wrocław University, Wrocław (Poland) – No. MP 703; 2 spec. The Zoological Survey of India, Calcutta (India).

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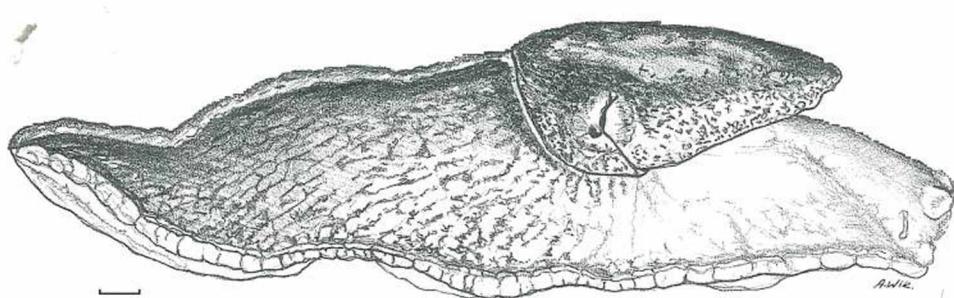
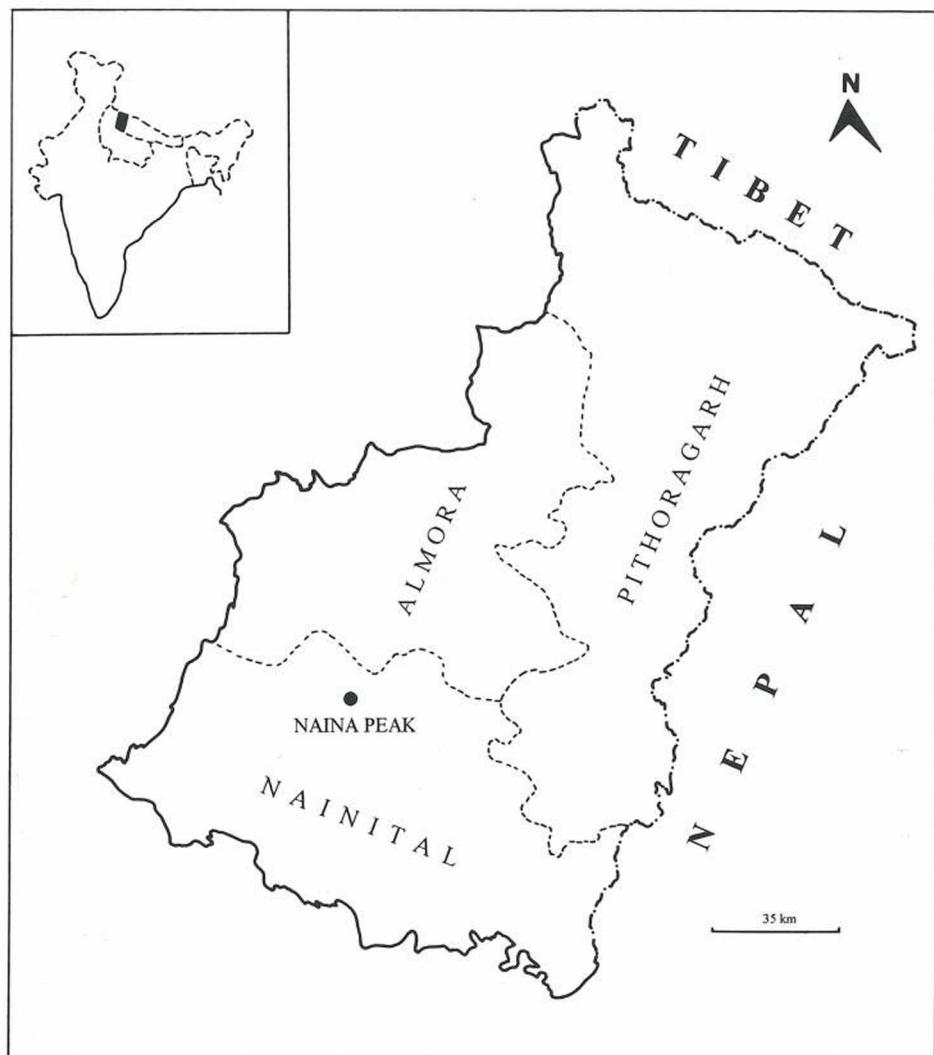


Fig. 1: *Turcomilax (Taulimax) oli* sp. n. – lateral view of the holotype (the scale bar with all figures equals 1 mm).

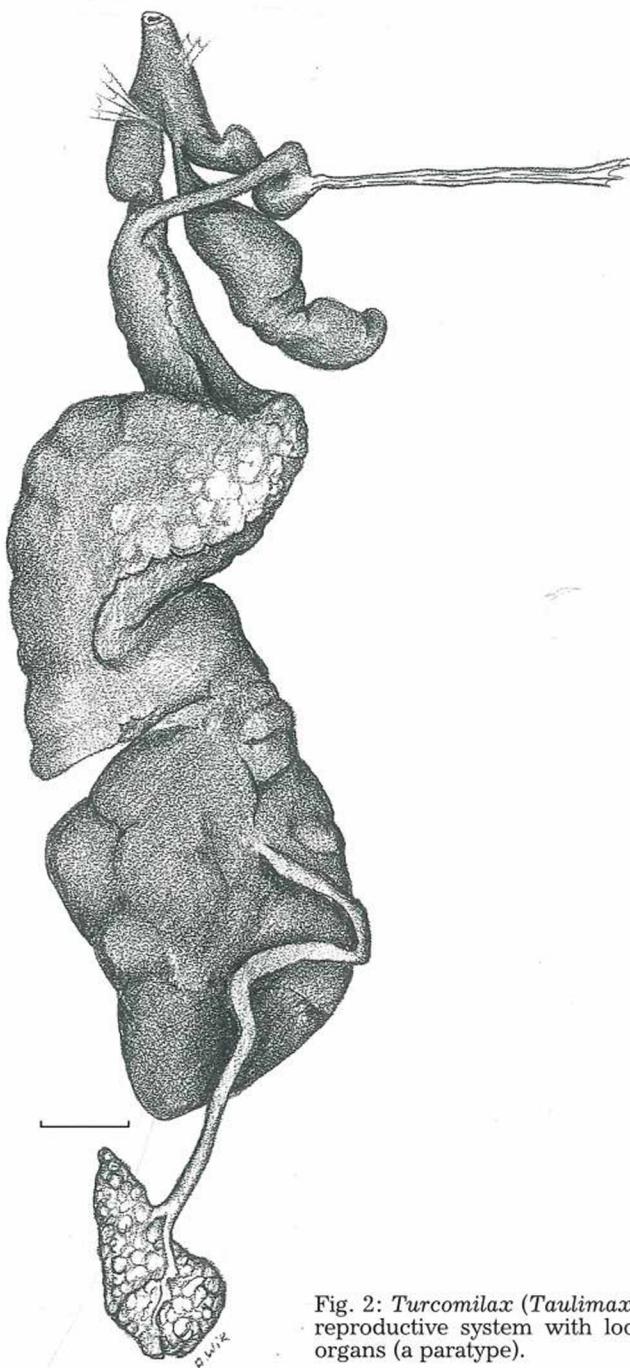


Fig. 2: *Turcomilax (Taulimax) oli* sp. n. –
reproductive system with loosely spread
organs (a paratype).

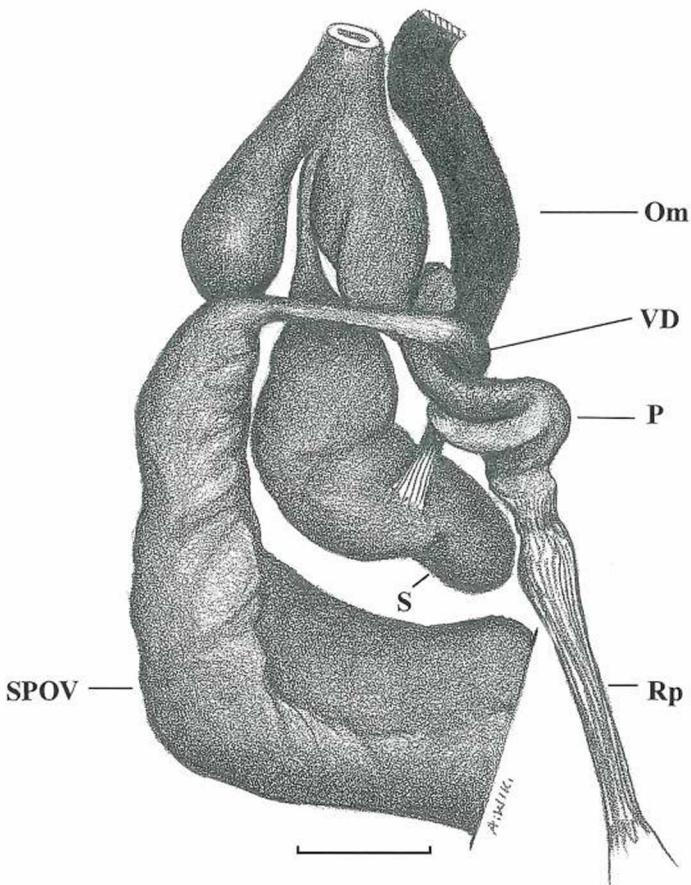


Fig. 3: *Turcomilax (Taulimax) oli* sp. n. – copulatory organs of the holotype in their natural relative position. Om – ommatophorus; P – penis; Rp – musculus retractor penis; S – bursa copulatrix; SPOV – spermoviductus; VD – vas deferens.

Diagnosis: A slug similar to *Turcomilax (Taulimax) turkestanus* (SIMROTH, 1898) but differing in both external appearance and internal features: a caecum on the third (last) intestinal loop is absent; penial shape and apical insertion of penial retractor muscle are distinct.

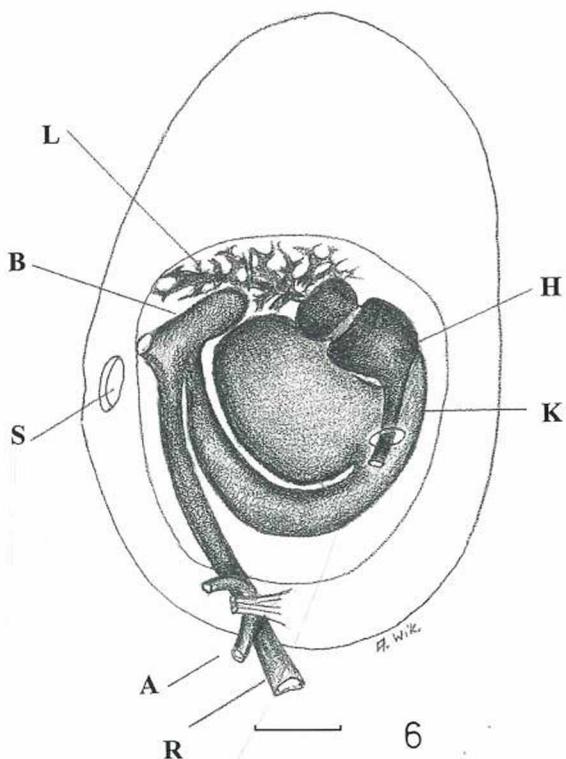
Description.

Size of alcohol-preserved slugs: body length of the largest specimen 32 mm, mantle length 9.5 mm, the largest width ca 8 mm. The holotype's dimensions: 31/10.5/7.5 mm respectively. Live, completely extended specimens attain ca 40 mm in length. Body width is greatest behind the mantle, posterior to which it narrows cuneately; keel strong and continuous from the mantle margin; 20–21 dermal tubercles extend from the keel to the groove of the pneumostome.

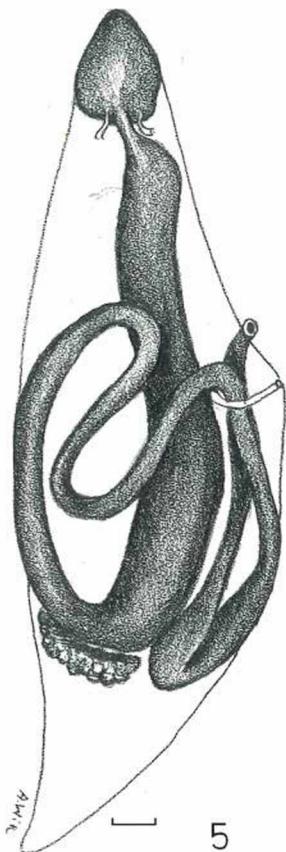
Colouration: General colouration of the back and sides (after preservation) black-brown, but uneven. Back darker, covered by diffuse spots with melanophore concentrations, between which paler spaces show on the whole body, especially on the mantle. In most specimens a light and blurred medial line and two dark lateral streaks run along the mantle



4



6



5

Figs 4-6: *Turcomilax (Taulimax) oli* sp. n. 4 - copulatory organs with opened penis and visible its internal structures (a paratype); 5 - alimentary canal with marked location of glandula hermaphroditica and body outline (a paratype); 6 - pallial complex viewed ventrally, mantle delineated. A - aorta; B - bladder; H - heart; K - kidney; L - lung; S - spiraculum.

(fig. 1). A pale ring encircles the pneumostome. Keel slightly paler, on its sides the dark pigment clearly becoming denser. Body sides are lighter, dirty cream, with irregular, sometimes indistinctly reticulate, concentrations of melanophores. The lateral zones of sole are grey, median section whitish. Mucus is of an unknown colour.

Genitalia (figs 2-4). A relatively small gonad is situated close to the posterior end of the first intestinal loop (fig. 5). Distinctive diagnostic features occur only within the copulatory organs. A comparatively thick and short vas deferens opens somewhat laterally on the rear end of the penis. In a natural position the vas deferens winds round the penis, coming full circle (fig. 3). Both penis and vas deferens cross the right ommatophore or its retractor. A thin and long penial retractor inserts apically to the penis close to the latter's junction with the vas deferens. The penis is small, spirally coiled; its anterior section tubular, posterior broad and club-like. Internally, the medial part of the penis exhibits a complex system of wrinkles (fig. 4) leading to a large anterior fold. The bursa copulatrix is attached to the penis. The ductus bursae is relatively short and very thin, gradually broadening into a large elongated sac, which may be twice the penial length. The free oviduct is very short, the anterior enlarges abruptly into a fleshy pear-shaped structure. Atrium short, barely delineated. The genital orifice situated near the base of the right ommatophore (fig. 1).

Alimentary canal (fig. 5). The first and the third intestinal loops extend posteriorly to an equal degree; the second is smaller, reaching at most half of the body length. The posterior coil of the third loop lacks a caecum or even a suggestion of one.

Pallial complex (fig. 6). Essentially similar to that of other members of the genus, the bladder being elongate and pear-shaped, the kidney being bean-shaped and devoid of lobus (kidney lobe).

Habitat.

Specimens were collected in a region of the Himalayan temperate monsoon climate with strongly seasonal rain fall (ca 80-90% in the wet season). The habitat exhibits a west facing aspect and is dominated by evergreen Oak (*Quercus leucotrichophora* and *Q. floribunda*) which possesses a closed canopy and provides deep shade. The age structure of trees demonstrates that the forest is long established with individual trees aged up to 350 years, the largest measuring about 35 m in height and 1.37 m in diameter at breast height. The average annual temperature of the area equals 15°C, that of the site ranging between 7.7°C and 24.1°C, the relative humidity amounting to 35-75%. The pH of the soil was slightly acidic (5.9-6.6).

Little information on the life history is available but egg-laying takes place from September to October and hatching is completed in about 70 days. The diameter of an egg is 6.5 mm. Individuals have been observed feeding at ground level on both living and dead plant material.

Distribution. The species is currently known only from the type locality - see map 1.

Etymology: The species has been named after Dr B. P. OLI from Kumaun University in India, who collected this slug when accompanying one of the authors.

Discussion.

T. (T.) oli most closely resembles *T. (T.) turkestanus* but it is smaller than *T. (T.) turkestanus* and of paler colouration; the body, including the mantle, is covered by irregular concentrations of a dark pigment, and indistinct lighter medial and two dark lateral lines occur along the mantle. A critical difference in the reproductive morphology is the insertion of the retractor on the posterior of the penis; in *T. (T.) turkestanus* the retractor inserts on the anterior half of the penis. The bursa copulatrix is proportionately more elongate and larger than in *T. (T.) turkestanus*. The posterior coil of the third intestinal loop lacks a caecum or even a shallow pocket. Other than *T. (T.) turkestanus*, members of this genus are quite distinct from *T. (T.) oli* (see LIKHAREV & WIKTOR 1980).

Acknowledgement

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