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Research Article

TWO NEW RECORDS OF TERRESTRIAL ISOPODS (ISOPODA: ONISCIDEA) FROM WEST BENGAL, INDIA

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ABSTRACT

Studies on Isopods in the terrestrial environment are so important due to their role in decomposition of leaf litter and their major involvement in nutrient cycling in soil. Considering the importance of isopods in gardens, terrestrial isopods were collected during 2024 from the public park near Kankana lake commonly known as Horse Bow Lake, at Gobardanga, North 24 Parganas district. About 6 specimens of isopods were taxonomically identified as a new record from West Bengal. The examined specimens belonged to the suborder Oniscidea Latreille, and 2 families, viz., Agnaridae and Trachelipodidae, of 2 species, namely *Agnara ferrarai* Jeon & Kwon, 1995 and *Nagurus sundaicus* (Dollfus, 1898), were reported in the present study and were recorded for the first time. The diagnostic characters of these two species were detailed.

Keywords: Oniscidea, Agnaridae, Trachelipodidae, Isopoda, West Bengal.

INTRODUCTION

Terrestrial isopods represent a diverse group of crustaceans, especially the suborder Oniscidea, commonly termed as wood lice (Broly *et al.,* 2013; Taiti, 2018). They play a major role in soil fertility by the process of decomposition (Zimmer & Topp, 1999) and enhance the functions of the soil ecosystem through nutrient cycling (Gestel *et al.,* 2018), promote the stability of organic matter in soil (Špaldoňová and Frouz, 2014) and bioturbation of the soil (Salman and Alsalman, 2025). They are potential indicators in moist habitats and in grasslands (Gerlach *et al.,* 2014). Oniscideans are the largest suborder of terrestrial isopods, with over 4,000 species, 500 genera, and 38 or 39 families recorded worldwide (Hornung, 2011; Schmalfuss, 2003; 2004; Schmidt, 2003; Schmidt, 2008; Javidkar *et al.,* 2015; Sfenthourakis & Taiti, 2015; Dimitriou *et al.,* 2019). Nagurus were recorded about 40 species. Agnaridae represented about 17 genera, and the genus Agnara has 24 species (WORMS, 2025). In India, 78 species of terrestrial isopods were reported from India (Tabassum *et al.* 2020). The present study aims to reveal the terrestrial isopoda from West Bengal.

MATERIAL AND METHODS

The present investigation has been carried out in a public garden located near Kankana Lake at Gobardanga, North 24 Parganas district of West Bengal. Terrestrial isopods were collected from surface soil under leaf litter and surrounding regions of shrubs in a garden with more human interactions due to highly influenced as visitors. By hand-picking method, the specimens were collected by using forceps, a brush and the specimens were preserved in 70% alcohol. Further, the specimens in the vials were labelled with all details. To extend the taxonomical studies to reveal the identification of the specimens, subjected to dissections under a microscope (Leica EZ4). The dissected body parts were placed on a slide and mounted in Euparal. Morphometrical studies and diagrams were carried out by using a stereozoom, compound microscopes attached with a camera lucida. CorelDRAW software was also used to refine the images. Identification of specimens was followed by the literature of Jeon & Kwon (1995) and Kwon & Taiti (1993).

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RESULTS AND DISCUSSION

In the present investigation, about 15 examples were collected, and only adult specimens were used for the taxonomic approach. We identified the isopod species collected for the study, viz., *Nagurus sundaicus* (Dollfus, 1898) and *Agnara ferrarai* Jeon & Kwon, 1995, using morphological characters. *Nagurus sundaicus* (Dollfus, 1898) belongs to the family Trachelipodidae and *Agnara ferrarai* belongs to the family Agnaridae, whereas both species were represented from the suborder Oniscidea.

Systematic Account:

Order Isopoda Latreille, 1817

Suborder Oniscidea Latreille, 1802

Family Trachelipodidae Strouhal, 1953

Genus *Nagurus* Holthuis, 1949

Nagurus sundaicus (Dollfus, 1898)

(Figure.1 A-H; Figure.2 A-F)

1926. *Nagurus insularium* Verhoeff, K. W. *Nova Caledonia. A. Zoologie.* 4(2): 241-366

1898. *Porcelio sundaicus* Dollfus, A. *Zoologische Ergebnisse einer Reise in Niederländisch Ost-Indien.* 4: 357-381, pls 13-15.

Material Examined: Five males; 27. xii.2024, coll. S.Dey; Reg. No.SZ102

Measurements: Length ranges from 2.71mm to 3.17mm, and width ranges from 1.19 mm to 1.6 mm

Description: The entire body is covered with tubercles possess a rough body surface, and exhibits deep brown with some muscle spots. The cephalothorax possesses three well-formed lobes. Eyes are small in size and contain approximately 12-13 ommatidia. The first two pereons possess rounded lateral edges, 3-7 are backwardly projected. The Epimera are distinctly separated from the remaining part of the pereon; a white marginal line demarcates the epimera from the rest of the pereon. The ventral margin of the merus and carpus region bears brush-like setae, and the ischium possesses one spine on the tergal margin in pereopod 1. In the 2nd segment, the merus and carpus bear numerous brush-like setae, and the 3rd to 6th segments possess several strong setae. The tergal margin bears 3-4 strong setae. The rostral surface is straight and devoid of setae. Several strong spines are present on the 7th pereopod of the male.

Pereon pleon with a continuous margin. The second antenna is two-jointed, the flagellum shows a distal to proximal segment ratio of 4: 1. Uropods are slender, pleotelson has a triangular apex, not sharply pointed. The right mandible exhibits a tooth pattern of 3 + 2**.** The left mandible shows a tooth pattern of 2 + 2. Both mandibles bear two bunches of setae. The outer lobe of the maxillula possesses at least ten denticles. The endite of the maxillipede is almost rectangular in shape and bears numerous spines. The outer margin contains 4-5 strong spines. The palp bears a bunch of setae. Male pleopod 1 exopod is rounded in shape and bears several strong spines, endopod possesses an outwardly bent, pointed apex with several apically distributed setae. Pleopod 1 The endopod possesses an outwardly bent, pointed apex bearing several apically distributed setae. Pleopod 2 Triangular in shape with a blunt tip; 1-2 strong setae are present on the outer surface. Pleopod 2 is longer in length with a pointed apical part. Pleopod 3-5 bear several strong spines.

Distribution: World: Pacific Ocean, Indian Ocean, Indonesia, Malaysia, China.

India: West Bengal.

Family Agnaridae Schmidt, 2003

Genus *Agnara* Budde-Lund, 1908

Agnara ferrarai Jeon & Kwon, 1995

(Figure.3 A-F, Figure.4 A-K)

1995. *Agnara ferrarai* Jeon, D. S. and Kwon, D. H. *Korean Journal of Systematic Zoology,* 11(2): 275-289.

Material Examined: One male, 27. xii.2024, coll. S.Dey; Reg. No. SZ103

Measurement: Length 6.4 mm, width 2.1mm.

Description:

The cephalothorax exhibits a dark brown to black colouration. The pleon region is also dark brown to black in colour. The pereon region exhibits a brownish-yellow colouration with several muscle spots. Epimera of all pereon segments are pale yellow or grey in colour. Each epimeron bears a distinct black muscle spot. The cephalothorax bears three well-formed lobes. The median lobe is anteriorly cleaved (notched in the front). Eyes are comparatively large in size, contains approximately 20 ommatidia. The pars incisiva bears four teeth, while the lacinia mobilis possesses two teeth in the right mandible and three teeth, and the lacinia mobilis possesses two teeth in left mandible. Both mandibles possess an extended bunch of setae. The outer lobe of the maxillula bears ten teeth. Rectangular in shape and provided with several spines in the maxilliped endite. The outer margin bears six strong spines, and the palp is short in length and provided with a bulk of setae. The first antennae are composed of three articles. The 2nd antennae consist of two segments, flagellus composed of 2 articles showing a distal: proximal ratio of 4:3.

Pereonites 1-7 are not broadened. A row of tubercles is present at the posterior end of the thorax. Noduli laterales are arranged near the lateral margin in a straight line. Pleotelson triangular, with a distinctly pointed apical end. Ventral margin of merus and carpus of pereopod 1 bearing brush-like setae; ischium with two spines on the tergal margin; several spines in pereopod 1. Pereopod 2 with numerous brush-like setae on merus and carpus. Pereopods 3-6 without specialisation. Male pereopod 7 with 5-6 strong setae on the tergal margin; rostral surface straight, devoid of setae. Merus, carpus and propodus of pereopod 7 are

armed with several strong spines. Male pleopod 1 exopod pear-shaped, with a rounded apex bearing several strong spines. Pleopod 1 endopod with an outwardly bent, pointed apex, with several setae distributed medially. Pleopod 2 exopod triangular, bearing 1-2 strong setae on the outer surface. Pleopod 2 endopod prolonged, terminating in a pointed apical part. Pleopods 3-5 are furnished with several strong spines.

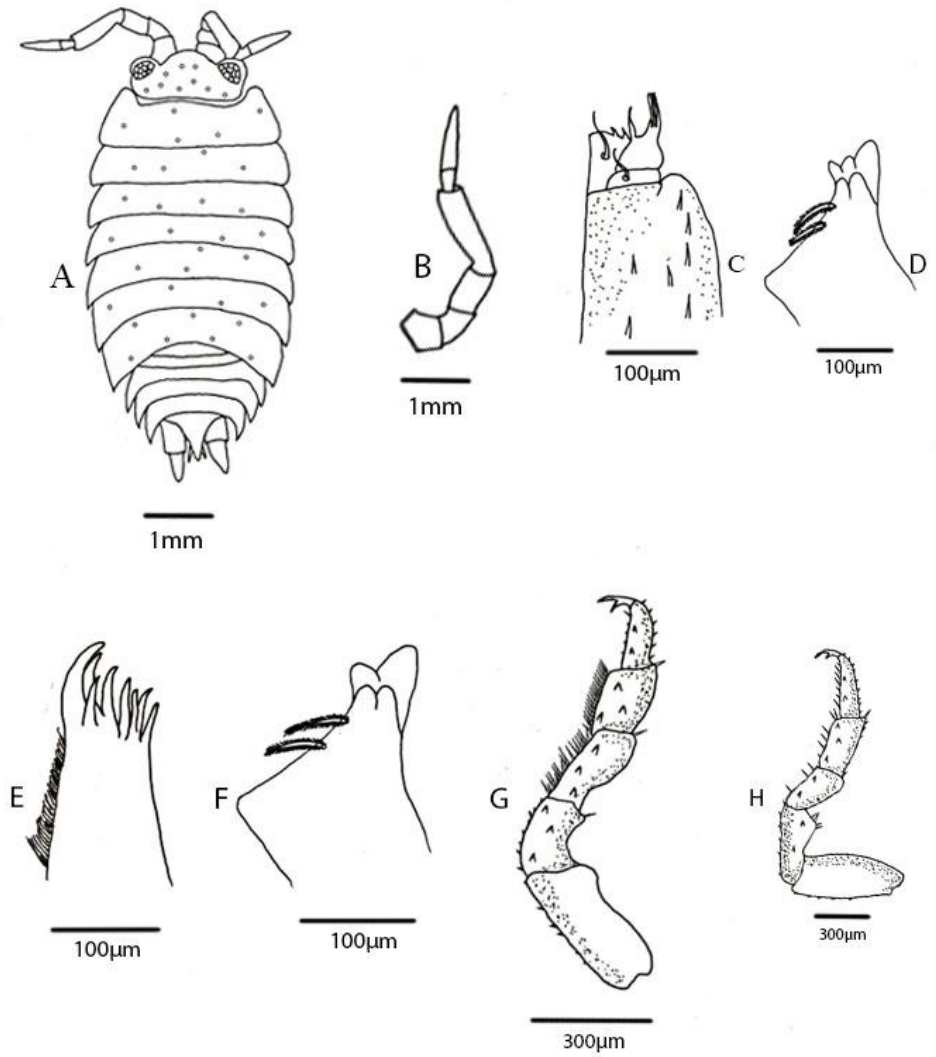

Figure 1. *N. sundaicus* Male A - Dorsal View, B - Antenule, C- Maxilliped, D - maxillula, E - right mandible, F - left mandible, G - 1st pereopod, H - 7th pereopod.

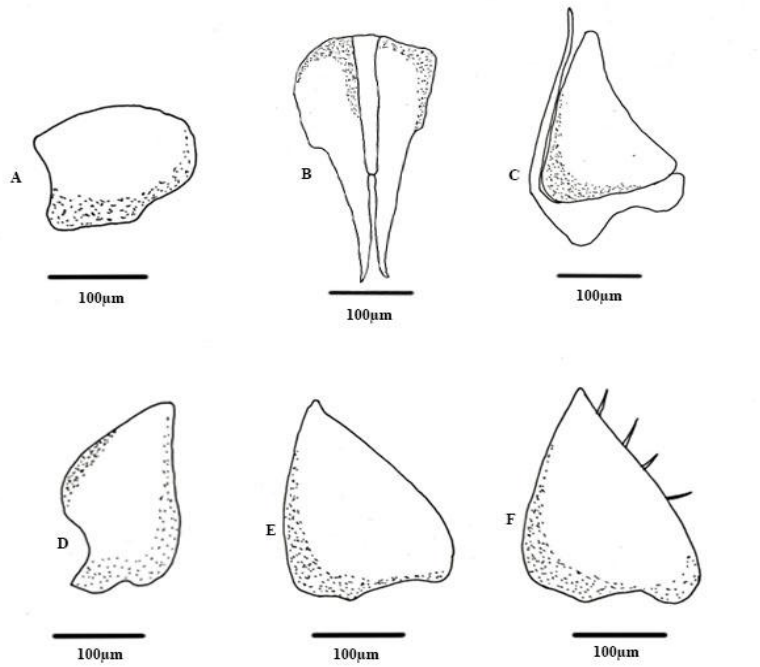

Figure 2. *N. sundaicus* Male, A- exopod of 1st Pleopod, B - endopod of 1st Pleopod, C - exopod with endopod of 2nd Pleopod, D - 3rd Pleopod, E- 4th Pleopod, F - 5th Pleopod.

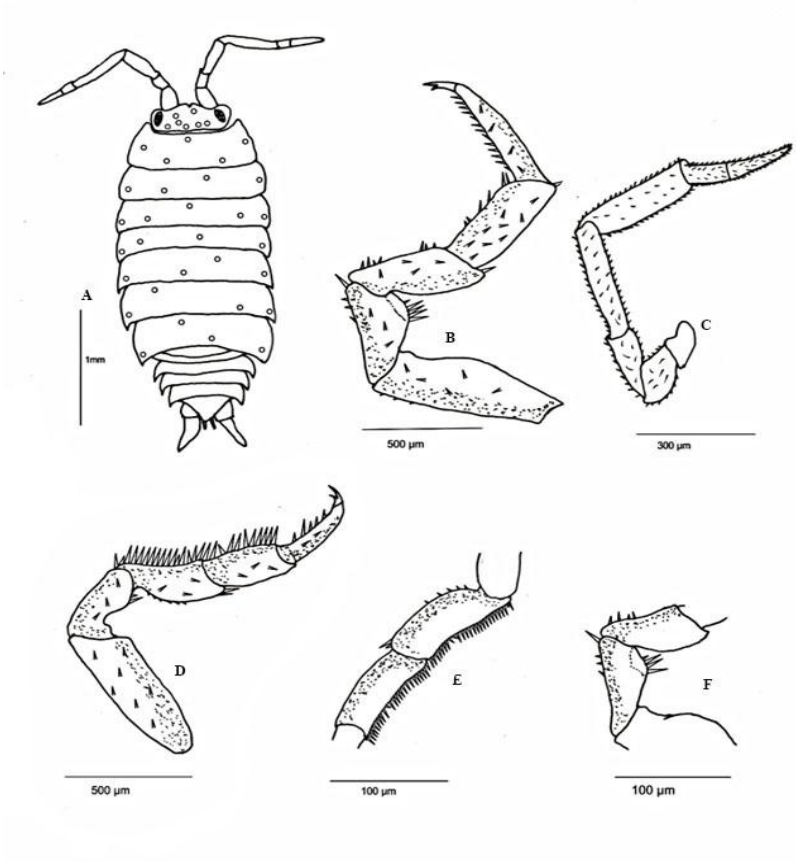

Figure 3. *A. ferrarai* Male A - Dorsal view, B - 7th Pereopod, C- antennule, D - 1st Pereopod, E- carpus and merus of 1st pereopod, F- ischium of 7th pereopod.

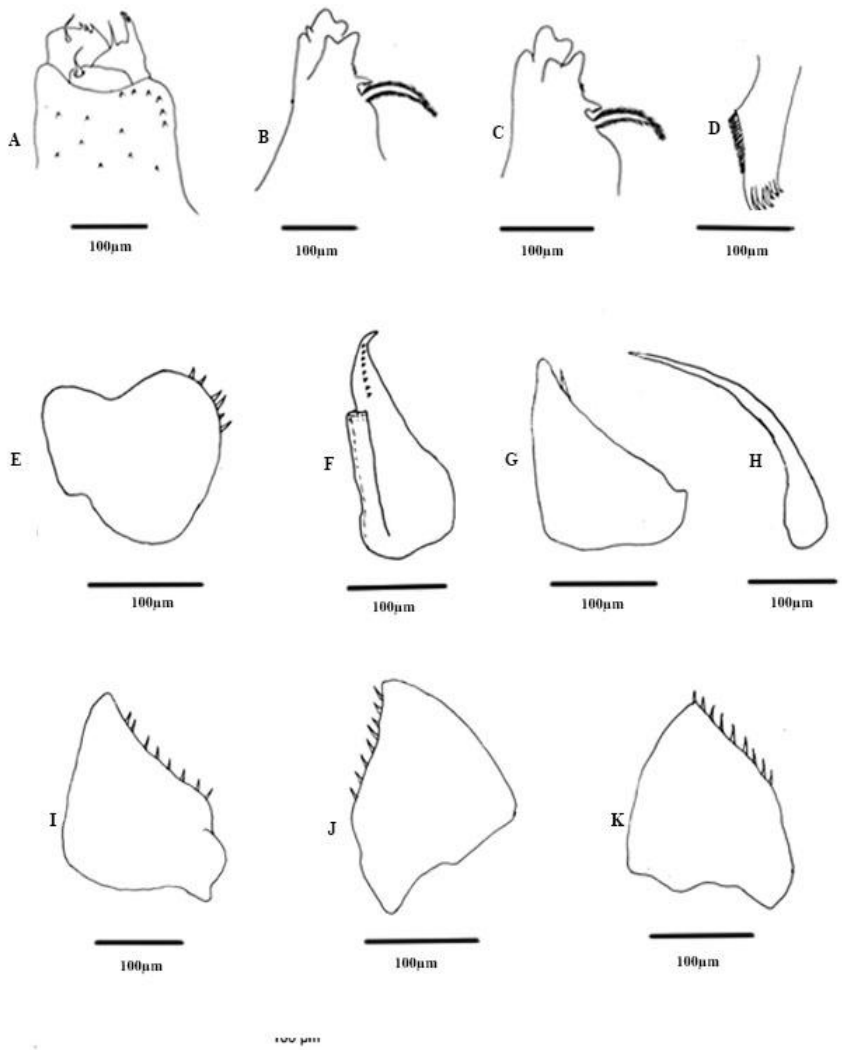

Figure 4. *A. ferrarai* Male A - right mandible, B - left mandible, C- maxillipede D - maxillule, E- exopod of 1st Pleopod F- endopod of 1st Pleopod, G - endopod of 2nd Pleopod, H- endopod of 2nd Pleopod, 1 - 3rd Pleopod 3 J - 4th Pleopod, K- 5th Pleopod.

Distribution: World - Taiwan; India - West Bengal

The genus Nagurus belongs to Trachelipodidae and is reported to have about 5 species in India. *Nagurus acutitelson* (Ferrara and Taiti, 1982) and *Nagurus havelocki* (Ferrara & Taiti, 1982) from the Andaman Islands, *Nagurus carinatus* (Dollfus, 1905) from Odisha, *Nagurus clavigerus* (Verhoeff, 1936) from Tamilnadu and *Nagurus travancorius* (Verhoeff, 1936) from Kerala (Tabassum, 2020; Eshaghi *et al.,* 2015). Agnaridae comprises 15 species globally, whereas in India, only three species were reported: *Agnara carinata* (Collinge, 1915) and *Agnara hispida* (Collinge, 1915) from Odisha, and *Agnara immsi* (Collinge, 1914) from Uttar Pradesh. The present investigation of the two species was observed at West Bengal and recorded for the first time from India. The present investigation of the two species was recorded at West Bengal and recorded for the first time from India.

Few studies reported that isopods attached to survive in a few habitats like forests, paddy, grasslands, and parks (Smith *et al*. 2005; Taiti and Ferrara, 1991 and Dauber *et al.,* 2005). This study indicates species occurrence in the park, where human interactions with the local environment are significant. This finding on these two species represent two new records to India.

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CONFLICT OF INTERESTS

The authors declare no conflict of interest

ETHICS APPROVAL

Not applicable

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AI TOOL DECLARATION

The authors declares that no AI and related tools are used to write the scientific content of this manuscript.

DATA AVAILABILITY

Data will be available on request

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