

**UNIVERSITY OF JAMMU RESEARCH FUND (UoJRF)**  
**Form-V**  
**PROJECT COMPLETION REPORT**  
**(Submit in duplicate)**

- 1. Title of the Project:** Morphology and molecular taxonomy of Terrestrial isopods from Jammu region of J&K UT.
- 2. Name & Designation of Principal Investigator:** Prof. Seema Langer, Department of Zoology, University of Jammu.
- 3. Name and Designation of Co- Principal Investigator** : N/A
- 4. Duration of Project** : One Year
- 5. Sanctioned grant** : Rs. 200,000/-
- 6. Date of Initiation of the Project** : 23-01-2023
- 7. Date of closure of the Project** : 15-03-2024
- 8. Whether the Utilization Certificate and statement of expenditure has been submitted:** Yes (Copy Attached)
- 9. Approved objectives:**
- 1) To assess the biodiversity of terrestrial isopods of Jammu region.
  - 2) To give a detailed taxonomic description of collected species.
  - 3) To identify the species having economic and agricultural values.
  - 4) To formulate identification keys for the same.
  - 5) To confirm the taxonomy of terrestrial isopods through molecular characterization (DNA Barcoding)
- 10. Title of the research paper published from out of the current project work (if any, attach print copy)** : Under preparation

11. Title of the research paper accepted for publication from current research work (if any, attach a copy of acceptance letter) : N/A
12. Report of the completed research project highlighting the deliverables (Attach document-Min. 2000 words) : Copy Attached
13. Details of the consumables and non-consumables (including equipment) material procured from current research project grant: Copy Attached.
14. Has the non-consumables materials (including equipment) been handed over to the concerned department? Yes/No (if yes, attach a certificate issued by concerned HoD in this regard) (If no, the reason thereof): Not handed over to the Department. The equipment purchased in the department is being put to use for the conduct of research activities.
15. Has the stock register carrying entries of consumables/ non-consumables (including equipment) handed over to the concerned department? Yes/No (If yes, attach a certificate issued by concerned HoD in this regard) (if no, the reason thereof): No, the entries for all the purchases for consumables and non-consumables have been made in the stock register.
16. Was power point presentation of the current research work made before DRPMC by PI/Co-PI? Yes/No (if yes, attach a certificate issue by concerned Dean/ HoD in this regard (If no, the reason there off) : Yes

**UNIVERSITY OF JAMMU**  
**UNIVERSITY OF JAMMU RESEARCH FUND**  
**SIX MONTH PROGRESS REPORT**

Project File Reference No.RA/3977-92

1. Title of the Project: **Morphology and molecular taxonomy of Terrestrial isopods from Jammu region of J&K UT.**
2. Name & Designation of Principal Investigator: **Dr. Seema Langer, HOD Zoology.**
3. Name and Designation of Co- Investigator: **N/A**
4. Duration of Project: **1 year**
5. Sanctioned grant: **Rs. 200,000/-**
6. Date of Initiation of the Project: **23<sup>rd</sup> Jan, 2023**
7. Objective/s achieved:  
**Detailed work on morpho taxonomy of *Burmoniscus* sp. and DNA barcode of the same species.**
8. The amount of research work completed in the current project:

The proposed objectives for the project are as under:

- 1) To assess the biodiversity of terrestrial isopods of Jammu region.
- 2) To give a detailed taxonomic description of collected species.
- 3) To identify the possible species having economic and agricultural values.
- 4) To formulate identification keys for the same.
- 5) To confirm the taxonomy of terrestrial isopods through molecular characterization (DNA Barcoding)

During the first six months of the project, following objectives were covered.

- Assessing the biodiversity of terrestrial isopods from Jammu region
- Studying the taxonomic description of collected taxa.
- Exploring the agricultural and economic values of the species

During the next six months i.e., from July 2023- December 2023, more sampling was done during which various localities of Jammu region have been extensively surveyed and the remaining two objectives have been studied.

Earlier three species of terrestrial isopods were reported which were identified on the basis of preliminary classical taxonomy. The three species were identified as *Porcellio assamensis*, *Philoscia lodnensis* and *Porcellio* sps. on the basis of their morphological characters.

However, DNA Barcoding of *Philoscia lodnensis* redescribed it to be *Burmoniscus meeusei*. Both of them belong to the same family Philosciidae and morphological similarity is so evident in both the genus that for more than a decade both the genus has been used as synonyms.

### ***Burmoniscus* (Morpho-taxonomy)**

**Genus *Burmoniscus* Collinge, 1916:** Genus *Burmoniscus* consists of a total of 88 species, out of which 2 are already reported from India which are *B. kempfi* (Collinge, 1916) reported from Meghalaya and *Burmoniscus javanensis* (Richardson, 1922) reported from Uttar Pradesh, Himachal Pradesh. Both of these species are reported by Ramakrishna in 1995. So, the present species is a first report from the country. This genus is primarily characterised by features such as the presence of sulcus marginalis and Glang pores on the pereonites, noduli lateralis positioned away from the lateral margins on pereonites 2 and 4, and a reduction and close positioning of the epimera of pleon. The head exhibits supra-antennal line without a frontal line, mandible with molar penicil reduced to a single plumose seta.

### ***Burmoniscus meeusei* Holthius, 1947**

Kingdom- Animalia

Phylum- Arthropoda

Sub-Phylum- Crustacea

Class- Malacostraca

Super-order- Peracarida

Order- Isopoda

Suborder - Oniscidea

Family- Philosciidae

Genus- *Burmoniscus*

Species – *meeusei*

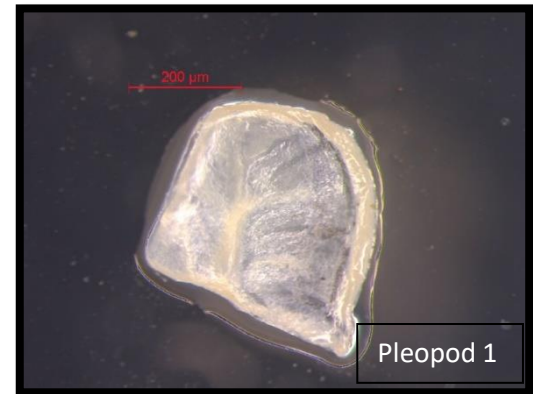
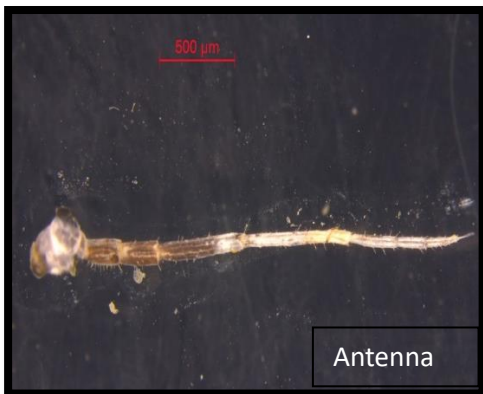
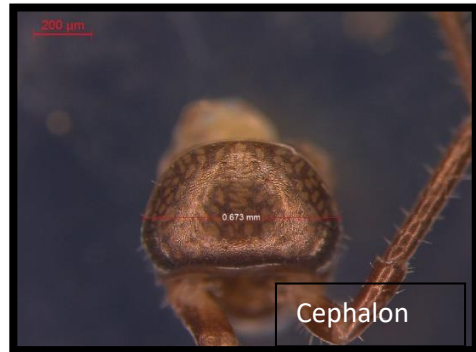
**Distribution:** Among India states it has not been reported from anywhere, since this is a first report. Among the foreign countries it has been reported from China, Japan and Hong Kong.

**Diagnosis:** *Burmoniscus meeusei* can be distinguished from congeneric species by a small lobe on the inner margin of the apical part of the male pleopod 1 endopodite, a triangular distal part on the male pleopod 1 exopodite, and the round apex of the pleotelson (see Holthuis 1947).

**Description:** Mean size of specimen is 2mm. Body elongated, somewhat oblong with dorsal surface slightly convexly bent. The first pereon appears the least wide and the sixth pereon appears the widest. The dorsal doesn't consist of any hairs and middle region of the dorsal surface has very minute granules. Yellow patchy patterns cover the dorsal surface. The body is light brown in color. Cephalon is triangular and appears twice wider than its length. Dorsal surface of head with tiny tubercles and is clearly distinct from the pereonite I. It has numerous oval patterns all over the dorsal surface. Smooth cephalic frontal margin. The anterolateral lobes not well projected and the posterolateral area is rounded. Compound eyes, darkly colored pair of eyes present on either side of head (dorsolateral). Eyes consist of approximately 20 Ommatidia. Thorax appears slender. The first somite is the longest, rest are sub equal except it becomes widest at pereonite V and VI. The first somite project very slightly on either side of the head on the frontal half and is rounded backwardly. Epimera of pereonite I to IV with poorly developed round posterior margin, while it is well developed, arched backwardly in pereonite V, VI and VII ending into a sharp edge. The last pereonite covers the lateral edge of first three pleonite. Abdomen abruptly contracts and is distinctly narrower as compared to the thorax. The five pleonite are well distinct, broader at pleonite I and becomes narrower to the pleonite V. The lateral edged (epimera) is not pointed outwards, rather they have smooth outer margin. The pleotelson is larger than the pleonite. It is sub triangular and has a blunt end. The length of pleotelson reaches up to half of the protopodite.

The protopodite of uropod is small, slender, narrow and rectangular and extends beyond the tip of telson. Inner ramus with few setae reaching less than half of the outer ramus, terminating into a pointed tip. The exopodite has a stout base and tapering into an acute tip. It is longer than the protopodite.

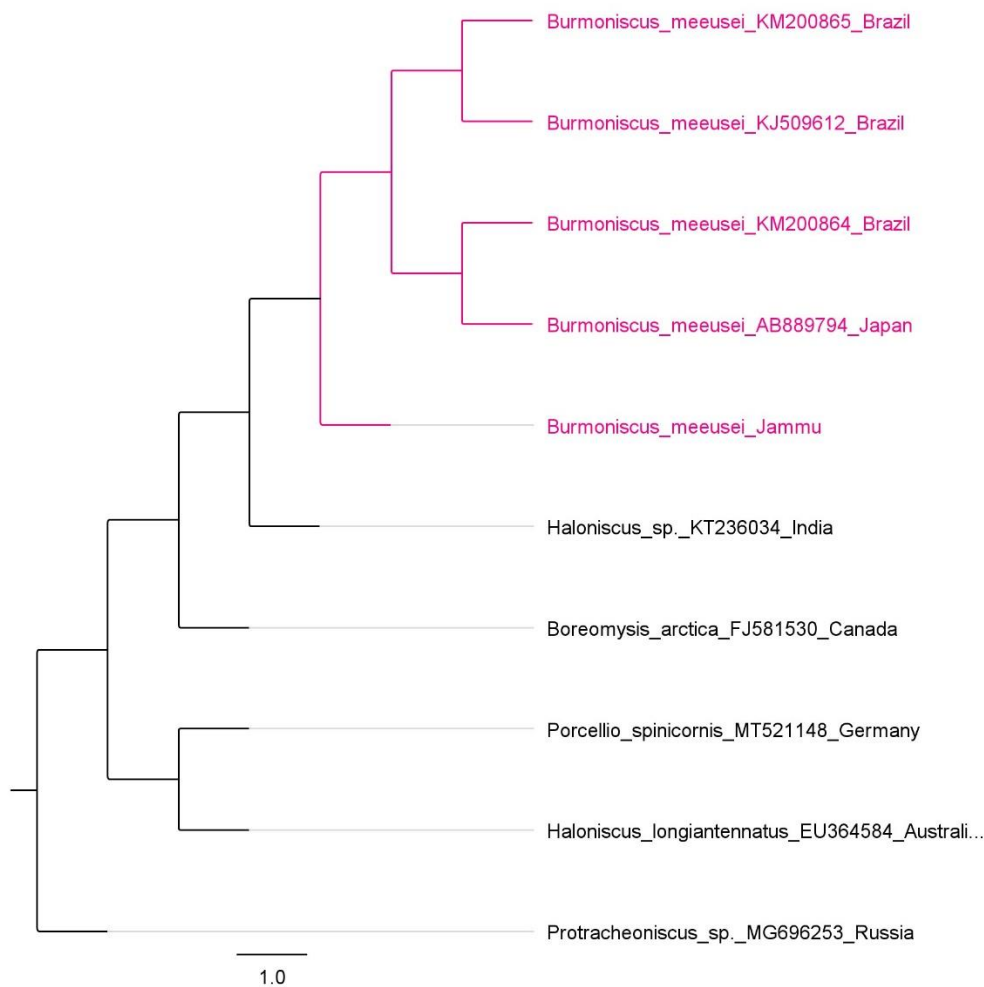
# Morphological Characteristics



**Live color:** The specimen examined were dark brown in color along with irregular yellow opaque patches in lateral and median rows. The epimera tip has yellow spots. The cephalon and pleon region is darker compared to the pereon. The ventral surface is creamy white or creamy yellow, with darker brown pleon area.

**Habitat and distribution:** The specimens are collected from university campus (botanical garden). Extensive digging up to a length of approximately 15 cm was required. All the specimens were collected from under trees present in shady areas with comparatively more moisture. The specimens were very scarcely present.

### Molecular Taxonomy:



**Phylogenetic Analysis:** In this study we examined COX1 gene for all the species reported from the area. The final length of the aligned sequences was 620 bp. Phylogenetic tree based on Bayesian inference was constructed using Geneious prime represented in the figure mentioned above. From the data inferred from the phylogenetic analysis it is clear that the species that was earlier reported *Philoscia lodnensis* is rather *Burmoniscus meeusei* which is the first report from India. The species is seen forming clade with other members of the same species (represented in same colour in the figure) from various regions of the world.

The molecular analysis of other species that have been morphological identified is still under progress.

**Key to identification of reported species:**

1. Antennal flagellum consisting of two segments; rough dorsal surface; first two pleon with breathing organ, pleon not abruptly contracted..... *Porcellio*.

2. Antennal flagellum consisting of three segments; smooth dorsal surface pleon abruptly narrower than pereon; Lungs absent in abdomen..... *Burmoniscus*.

**9. The amount of research work to be completed, in next six-month schedule, in the current project:**

Results of molecular characterisation of the species i.e., *Porcellio assamensis* is awaited.

**10. Deliverables, if any:**

- A species of *Burmoniscus* is reported during the present six months tenure of the project viz., *B. meeusei*.
- This species is a first report from the country.

Comment of the concerned DRC

Members:

Head of the concerned Department



**A. Comments of the concerned DRPMC**

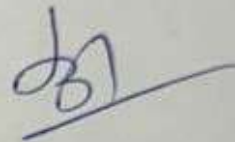
On the basis of progress report presentation made by DRPMC the work undertaken in the project is as per the objectives of the proposal and satisfactory.

**B. Members of the concerned DRPMC**

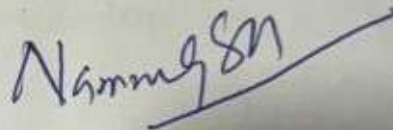
1. **Prof. Seema Langer**  
Dean Faculty life Science (Convenor)



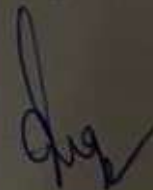
2. **Prof. Jyoti Vakhlu**  
(Professor, School of Biotechnology)



3. **Prof. Namrata Sharma**  
(Professor, Department of Botany)



4. **Dr. Arti Sharma**  
(Next senior most Faculty, Department of Zoology)



**Head of the concerned Department**

Head  
Deptt. of Zoology  
University of Jammu