

Morphological studies of species *Scolopendra jangii* and *Scolopendra subspinipes* from hatkanangle tehsil in Kolhapur district of Maharashtra

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Abstract

Centipede belongs to genus *Scolopendra* are terrestrial habitat and predatory in nature. The locomotion of *Scolopendra* was high speed, fast moving. The study area selected from Hatkanangle in Kolhapur District of Maharashtra. Two different species was collected and observed. Study of morphological characters of *Scolopendra jangii* and *Scolopendra subspinipes* species, selected antennal segments and also selected leg segments. Spines are present on all legs, attached to posterior region of leg and spine like hairy outgrowth present on tarsus and claws region.

Keywords: Scolopendra, centipede, *Scolopendra jangii*, *Scolopendra subspinipes*, Maharashtra

Introduction

The Scolopendridae in India is represented by two subfamilies, 3 tribes, 8 genera comprising about 70 species (Yadav, 1993)^[38]. *Scolopendra* belong in to class Chilopoda family Scolopendridae and order Scolopendromorpha. *Scolopendra* having 17 to 25 body segments with pair of legs. First pair of leg are modified called forcipules, *Scolopendra* species can deliver pain full bite, injecting venom through their forcipules. Centipede are dorsoventrally flattened animal fast moving, carnivorous, Nocturnal in habitat.

They are found in a tropical, subtropical areas and warmer temperate zone also many species found in tropical areas. The genus *Scolopendra* Linnaeus, 1758, is among the predominant centipede groups in tropical regions. These animals are generalist feeders that play an important role as one of the top carnivorous invertebrates in soil ecosystems. In several Asian countries *Scolopendra* has symbolic status in superstitions, and is used commercially in traditional medicine (Permberton, 1999).

New species continue to be discovered across the world, occupying diverse habitats such as dry scrub forests, savannah, evergreen forests in tropics and even temperate forests at higher latitude. Centipedes prefer cool and moist places and are often found in a leaf litter, under stone, and in gaps of barks. Interestingly, they also often live and breed among ferns on tree trunk. Centipedes are found in all the continents of the world except Antarctica. More than 3100 species of centipedes are currently known to science.

Previous Scolopendridae studies proposed that morphological variation within species is influenced by geographic distribution and ontogeny (Lewis, 2010)^[21]. The distribution is governed by geological history and thus understanding centipede diversity and distribution will be useful in testing, different biogeographic theories. Secondly, it has been shown that the western ghats of India is one of the biodiversity hotspots of the world (Myers et.al 2000)^[23]. Rich diversity of plants and animals also a type locality for many species of centipedes (Khanna, 2001)^[16]. Locomotion in most terrestrial animals is achieved primarily through appendicular movements. However, it is well known the axial movements can be enhance locomotion can be

increasing stride length and axial movements are often essential for attaining the highest speeds in vertebrates (Gray, 1968)^[9].

In this work, taxonomic study the two species the type material of species has been described and where available, type material is photographed and illustrated. Two species are compared with the most closely allied congeners to provide distinguished taxonomic characters. Variable in morphological character is recorded in order to document geographical variation. Variability observed colour of species, leg colour and size. Mostly antennal hair and spine present on leg this pattern is same.

Material and Method

The Study Site

The study was conducted in one area from Hatkanangle in Kolhapur District of Maharashtra. The substrate at the sites is limestone and vegetation are characterized by the dominance of the typical species.

Sample were collected during period 2023-2024. The collection of material took place over several days.

Climate

During the study air temperature and air relative humidity was typical normal. The climate was typical with high mean monthly air temperature (30°C). The present study including camera, notebook, glass jars, forceps, pins, glass scale, chloroform and Alcohol, microscope etc.

Data Collection

Species were collected using the handpicking method by searching under stone, in the leaf litter, in muddy places. Species collected and preserve under the Alcohol.

Scolopendra species was collected in the Hatkanangle tehsil of Kolhapur district of Maharashtra. *Scolopendra jangii* and *Scolopendra subspinipes* species are collected in the same area. One specimen about 8.2 cm length, 21 segments, blackish gray in colour and another specimen about 6.2 cm length, 21 segments, Black in colour, collected from Hatkanangle in Kolhapur district.

All the character Are observed under Microscope. The leg characters and length are measured using ocular

micrometer. The species identification was determined according to the previous workers. (Kang *et.al* 2017, Yadav *et.al* 2001, Chao *et.al* 2003).

Result and Discussion-

Study the morphological character with the help of two species of Scolopendra. Comparative study of these two species using different characters. These two species having one site and they have different colour, size and shape.

1. *Scolopendra jangii*

▪ Body colour Blackish Gray

Body colour is Blackish Gray. Head, cephalic plate, antennae, last segment and ultimate leg having brown colour. Trunk having 21 segments, in this segment having pair of legs 1st pair to 20th pair of legs observed yellow colour. Ventral site also yellow coloured.

Body length- (Fig. no. 1)

Body of Scolopendra measured by the scale, total length 8.2 cm, removing antennae the whole segment length 6.5 cm.

- Taxonomic character shows with help of head, Antennae, Forcípules, body segments, legs and ultimate leg.

2. Head, Antennae and Forcípules-

Head having cephalic plates, antennae having brown colour, total length of antennae 5.90 mm the antennae segments are 15, modification of antennae basal flat, globules scape. then middle single segment, provide site for flexor muscles of flagellum is pedicel and last is a flagellum terminal long part, multisegmented. The flagellum having 13 segment and hairs are present on the flagellum, in the flagellum 13 segments out of that segment 1,2,3,6,12 and 13 selected for see their measurement. (table no.1)

Total length of Antenna = Scape + Pedicel + Flagellum
 $0.45 + 0.50 + 4.95 = 5.90\text{mm}$

3. Body Segmentation

Total 21 Blackish Gray coloured segments. Cephalic plate having brown colour. All tergites are smooth, plate like, tergite of ultimate leg bearing segment. In the 21 segments selected 5 segments for the observing their measurements. (table no. 2)

Mostly the width of segments is same and length vary. Also, margination is started with second tergite to last tergite.

4. Legs and Ultimate Leg

All legs are showing yellow colour. They are attached to the different position of thorax and pleura. 21 pair of legs out of that 1,5,11,17,19 and 21 (ultimate leg) are selected to observed the character size and position.

First pair of legs was attached to ventral, anterior position of thorax. Fifth pair of leg was attached to ventral, middle position and 11th to 21th pairs of pairs of legs are attached to ventral, posterior region of thorax. The leg was classified into coxa, femur, tibia and tarsus. (Table no.5)

Character of Leg

- Spines are present on all legs attached to posterior region of leg.
- Spines like hairy outgrowth present on tarsus and claws region.

- Ultimate legs having brown colour total length is 1.8 cm. spines are present on leg hairy structure are observed on the leg surface.

5. *Scolopendra subspinipes*

▪ Body colour Black

Body colour is Black. Head, Cephalic plate, antennae, last segment and ultimate leg having brown coloured. Body having 21 segments, in this segment having pair of legs 1st pair to 20th pair of legs observed brown coloured. Ventral site also yellow coloured.

▪ Body length-(Fig. no.2)

Body of Scolopendra measured by the scale, total length 6.2 cm, removing antennae the whole segment length 4.9 cm.

- Taxonomic character shows with help of head, Antennae, Forcípules, body segments, legs and ultimate leg.

6. Head, Antennae and Forcípules-

Head having cephalic plates, antennae having brown colour, total length of antennae 4.03 mm the antennae segments are 12, modification of antennae basal flat, globulous scape. then middle single segment, provide site for flexor muscles of flagellum is pedicel and last is a flagellum terminal long part, multisegmented. The flagellum having 10 segment and hairs are present on the flagellum, in the flagellum 10 segments out of that segment 1,2,3,6,9 and 10 selected for see their measurement. (table no. 3)

Total length of Antenna = Scape + Pedicel + Flagellum
 $0.45 + 0.40 + 3.18 = 4.03\text{mm}$

7. Body Segmentation

Total 21 black coloured segments. Cephalic plate having brown colour. All tergites are smooth, plate like, tergite of ultimate leg bearing segment. In the 21 segments selected 5 segments for the observing their measurements (table no.4).

8. Legs and Ultimate Leg

All legs are showing brown coloured. They are attached to the different position of thorax and pleura. 21 pair of legs out of that 1,5,10,15,19 and 21 (ultimate leg) are selected to observed the character size and position.

First pair of legs was attached to ventral, anterior position of thorax. 5th to 10th pair of leg was attached to ventral, middle position and 15th to 21th pairs of legs are attached to ventral, posterior region of thorax.

Dimensions of legs like coxa, femur, tibia and tarsus (table no.6)

Character of Leg

- Spines are present on all legs attached to posterior region of leg.
- Spines like hairy outgrowth present on tarsus and claws region.
- Ultimate legs having brown colour total length is 1.9 cm. spines are present on leg hairy structure are observed on the leg surface.
- Ultimate leg first segment only having anterior region spine. Last segment of ultimate leg present spine to posterior site.



Fig 1: Colour and body length of *Scolopendra jangii*



Fig 2: Colour and body length of *Scolopendra subspinipes*

Table 1

Segments	Measurements	
	L(mm)	W(mm)
1	0.50	0.37
2	0.45	0.30
3	0.45	0.25
6	0.55	0.25
12	0.40	0.15
13	0.30	0.15

Table 2

Segments	Measurements	
	L(mm)	W(mm)
1	1	5
5	3	5
11	4	5
17	3	4
19	3	4

Table 3:

Segments	Measurements	
	L (mm)	W(mm)
1	0.48	0.50
2	0.50	0.40
3	0.50	0.38
6	0.50	0.30
9	0.50	0.24
10	0.45	0.22

Table 4

Segments	Measurements	
	L(mm)	W(mm)
1	1	3
5	2	3
10	2	4
15	3	4
19	3	2

Table no. 1 4. Table no. 1 and 2 *Scolopendra jangii* measurements of antennal and also show flagellar formula and body segments respectively,

Table no. 3 and 4 *Scolopendra subspinipes* measurements of antennal and also show flagellar formula and body segments respectively.

Table 5

Pair of leg	Total length of leg (mm)	Coxa		Femur		1 st tibia		2 nd tibia		1 st tarsus		2 nd tarsus	
		L	W	L	W	L	W	L	W	L	W	L	W
1 st pair	2.27	0.25	0.35	0.55	0.40	0.35	0.37	0.32	0.30	0.60	0.20	0.20	0.15
5 th pair	3.55	0.20	0.60	0.75	0.60	0.35	0.70	0.25	0.50	0.85	0.23	0.45	0.15
11 th pair	3.55	0.25	0.60	0.75	0.65	0.60	0.60	0.75	0.50	0.80	0.20	0.40	0.17
17 th pair	4.05	0.40	0.85	0.80	0.76	0.80	0.65	0.65	0.55	0.80	0.25	0.60	0.17
20 th pair	4.81	0.45	0.75	0.90	0.78	0.95	0.65	0.96	0.52	0.90	0.35	0.70	0.20

Table 6

Pair of leg	Total length of leg (mm)	Coxa		Femur		1 st tibia		2 nd tibia		1 st tarsus		2 nd tarsus	
		L	W	L	W	L	W	L	W	L	W	L	W
1 st pair	2.47	0.20	0.28	0.45	0.35	0.35	0.30	0.55	0.28	0.52	0.20	0.40	0.13
5 th pair	2.87	0.25	0.40	0.52	0.45	0.65	0.40	0.58	0.25	0.55	0.18	0.32	0.15
10 th pair	3.32	0.20	0.60	0.65	0.55	0.42	0.50	0.70	0.40	0.90	0.25	0.45	0.15
15 th pair	4.43	0.20	0.70	0.60	0.70	0.52	0.50	0.71	0.40	0.90	0.23	0.50	0.17
20 th pair	4.39	0.20	0.78	0.95	0.70	0.89	0.57	0.90	0.45	0.90	0.30	0.55	0.19

Table no. 5 to 6. Table no. 5 Dimensions of leg of *Scolopendra jangii* and Table no. 6 Dimensions of leg of *Scolopendra subspinipes*.

Conclusion

The present study provides detailed morphological analysis of *Scolopendra jangii* and *Scolopendra subspinipes*. The morphological characters observed in this study were useful for the identification and classification of *Scolopendra jangii* and *Scolopendra subspinipes* species, provide a basic for further taxonomic and diversity studies.

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