SCOLIID WASPS (INSECTA : HYMENOPTERA : SCOLIIIDAE) OF MAHARASHTRA

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ABSTRACT:

Studying insect diversity is a kind of difficult task as they are known to occupy a wide range of diverse microhabitats and contributing in ecosystem services of many kinds. To apply the conservation strategies the comprehension of diversity is a foremost prerequisite. The present endeavor is an attempt to study the Scoliid wasps of Maharashtra region. The present paper mentions 18 species belonging to 8 genera of the family Scoliidae (Insecta: Hymenoptera). They were collected from different parts of Pune and Kolhapur districts in the Northern Western Ghats of Maharashtra. Of these, Campsomariella (Annulimeris) annulata annulata (Fabricius, 1793), Phalerimeris phalerata turneri (Betrem, 1928), Liacos erythrosoma erythrosoma (Burmeister, 1854), Megascolia (Regiscolia) azurea hindostana (Micha, 1927), Scoli (Discolia) picteti (Saussure, 1855) and Scoli (Discolia) quadripustulata (Fabricius, 1782) are new to the Scoliid fauna of Maharashtra state. This study also imparts the collection of Scoliid fauna reported by some other workers previously. Synonyms and distributional data for each species are included.

Key Words: Distribution, Hymenoptera, Kolhapur, Pune, Scoliidae, Western Ghats.

INTRODUCTION:

The members of Order Hymenoptera are of great ecological and economic importance and include both useful and injurious forms. The ecological ubiquity and dominance of bees, wasps and ants make the order a pivotal member of most ecosystems. The Scoliid wasps of family Scoliidae are among the most interesting wasps under this order. These wasps are
significant ectoparasites on grubs of Scarabaeidae and sometimes Curculionidae (Coleoptera) which are the pest of agriculture and forests besides adult wasps assist in pollination (Krombein, 1978; Gupta and Jonathan, 2003; Gadallah, 2004). The family Scoliidae is comparatively a small family with cosmopolitan distribution and consists of 560 species distributed among 43 genera in two subfamilies (Osten, 2005).

The faunistic and taxonomic study of family Scoliidae started in India in late nineteenth century when has given a consolidated account on Scolid wasps of India and adjacent countries in Fauna of British India series on Hymenoptera (Bingham, 1897). Betrem (1928) brought out a monograph on Indo-Australian Scoliidae. The monograph of Krombein (1978) on the Scoliidae of southern India and Ceylonese (now Sri Lanka) can be considered as the key-stone in the taxonomy of Indian hairy wasps. His commendable and comprehensive biosystematics work has given detailed taxonomic information on true scoliids, raising several new taxa, re-describing and synonymysing the existing ones. These pioneer works on Indian scoliids followed by many workers later on in India. Jonathan and Gupta (1999a, b) studied the family Scoliidae in the state fauna series of West Bengal and Meghalaya state respectively. Ray (2000) has studied the diversity of Scoliidae wasps of Tripura. A consolidated account on Scoliidae fauna of India and adjacent countries has given by Gupta and Jonathan (2003) in fauna of India series of Zoological Survey of India. They have accounted total 79 species under 13 genera, among them 8 species and 5 subspecies are new to science. Jonathan and Gupta (2003) further studied the scoliids of Sikkim. Girish Kumar and Kazmi (2008) have given the new distributional records of Megacampsomeris prismatica to north-east India. Girish Kumar (2009a, b) studied the range extension of Megascolia azuria christiana in north India and scoliids of Andhra Pradesh respectively. Girish Kumar (2010) has given the checklist of Indian scoliids. The systematic study of scoliid wasps of Jaldapara Wildlife Sanctuary of West Bengal has been documented by Bhattacharjee et al. (2010). Girish Kumar (2011) reported extended distribution of Scolia
(Discolia) binotata binotata in north-east India. In recent times, Girish Kumar and Sharma (2015) have given an account on diversity of scoliid fauna of Rajasthan.

As regards systematic and diversity studies on hairy wasps of Maharashtra state is inadequately known. Important early attempt was by Girish Kumar and Kazmi (2012), with enumeration of 10 species of scoliids from Maharashtra. Recently, Jadhav et al. (2014) reported a scoliid wasp, Scolia (Discolia) fasciatopunctata dunensis Betrem, 1928 first time from Western Ghats of India as well as from peninsular India. Subsequently, Jadhav and Gaikwad (2014) documented the new geographical distribution of Megacampsomeris cochinensis Betrem, 1928 from the Northern Western Ghats.

The present paper deals with scoliid fauna of Pune and Kolhapur districts of Northern Western Ghats of Maharashtra state. A total of 18 species pertaining to 8 genera have been reported from Maharashtra out of which 6 species are first time reported from the state. Out of these two species, Micromeriella marginella marginella (Klug) and Phalerimeris madurenensis (Betrem) were not reported during present study but earlier reported from Satara and Pune districts of Maharashtra by Girish Kumar and Kazmi (2012). Another two species, Scolia fasciatopunctata dunensis Betrem and Megacampsomeris cochinensis (Betrem) were first time reported from Maharashtra by Jadhav et al. (2014) Jadhav and Gaikwad (2014) respectively.

MATERIAL AND METHODS:

The scoliids were collected at different localities in Pune and Kolhapur districts, Maharashtra during 2012-2014. (Figure 1 and 2). They were captured by sweep net in flight. Both the districts are located in Northern Western Ghats of Maharashtra state between 15°-19° N and 73°-75° E, covering an area of 23327 km². Classification, nomenclature and distributional data of Scoliidae suggested by Gupta and Jonathan (2003) and Girish Kumar (2009) have been followed. All the specimens properly curated, registered and deposited in National Zoological Collections of the Zoological Survey of India, Western Regional Centre, Entomology Section, Pune (NZC, ZSI, WRC).
RESULTS AND DISCUSSION:

SYSTEMATIC LIST

Order: Hymenoptera
Suborder: Aculeata
Superfamily: Vespoidea
Family: Scoliidae (Hairy or Flower Wasps)
Subfamily: Scoliinae
Tribe: Campsomerini Betrem, 1972

1 Genus Colpacampsomeris Betrem, 1941

2 Genus Micromeriella Betrem, 1964
2. Micromeriella marginella marginella (Klug, 1810)*

3 Genus Campsomeriella Betrem, 1941
3. Campsomeriella (Campsomeriella) collaris collaris (Fabricius, 1775)
4. Campsomariella (Annulimeris) annulata annulata (Fabricius, 1793)

4 Genus Phalerimeris Betrem, 1967
5. Phalerimeris phalerata turneri (Betrem, 1928)
6. Phalerimeris madurensis (Betrem, 1928)*

5 Genus Megacampsomeris Betrem, 1928
7. Megacampsomeris reticulata (Cameron, 1892)
8. Megacampsomeris cochinensis (Betrem, 1928)

Tribe: Scoliini Betrem, 1972

6 Genus Liacos Guerin, 1838
9. Liacos erythrosoma erythrosoma (Burmeister, 1854)

7 Genus Megascolia Betrem, 1927
10. Megascolia (Regiscolia) azurea hindostana (Micha, 1927)

8 Genus Scolia Fabricius, 1775
11. Scolia (Discolia) affinis (Guerin, 1838)
12. Scolia (Discolia) bilunata (de Saussure, 1858)
13. Scolia (Discolia) binotata binotata (Fabricius, 1804)
14. *Scolia (Discolia) cruenta* (Klug, 1805)

15. *Scolia (Discolia) cyanipennis* Fabricius, 1804

16. *Scolia (Discolia) fasciatopunctata dunensis* Betrem, 1928

17. *Scolia (Discolia) picteti* (Saussure, 1855)

18. *Scolia (Discolia) quadripustulata* (Fabricius, 1782)

(Note: * not reported during present study)

1. *Colpacampsomeris indica deccanensis* Gupta and Jonathan, 2003

(Plate I: Image 1)


**Material Examined:** 1 female, Lenyadri, Junnar Taluk, Pune, 14.04.2012, NZC, ZSI, WRC, Ent.6/122, coll. M.J. Jadhav.

**Distribution:** India: Karnataka, Kerala and Maharashtra.

**Remarks:** The specimens were only reported from Kolhapur district of Maharashtra around 27 years later. (Gupta and Jonathan, 2003).

2. *Micromeriella marginella marginella* (Klug, 1810)

Remarks: Reported from Satara and Pune districts by Kumar and Kazmi (2012)

3. *Campsomeriella (Campsomeriella) collaris collaris* (Fabricius, 1775)

(Plate I: Image 2)


**Material Examined:** 1 female, Dimbhe dam and around, Dimbhe, Ambegaon, Pune, 20.4.2012, NZC, ZSI, WRC, Ent.6/131 and 1 male, Sandbhorwadi, Rajgurunagar, Pune, 15.6.2012, NZC, ZSI, WRC, Ent.6/226 coll. M.J. Jadhav.
**Distribution:** India: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal.

**Elsewhere:** Nepal and Sri Lanka.

**Remarks:** This is one of the most common and abundant scoliids of India distributed in most parts of the country.

4. *Campsomariella (Annulimeris) annulata annulata* (Fabricius, 1793)

(Plate I: Image 3)


**Material Examined:** 1 male, Golewadi, Sinhagad forest, Haveli, Pune, 23.11.2012, NZC, ZSI, WRC, Ent.6/227 coll. M.J. Jadhav.

**Distribution:** India: Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Jammu & Kashmir, Maharashtra, Manipur, Meghalaya, Sikkim, Tripura, Uttarakhand and West Bengal.

**Elsewhere:** China, Indonesia, Japan, Korea, Malaysia, Myanmar, Nepal and Taiwan.

**Remarks:** First time reported from Maharashtra also constitutes to the first report from Western Ghats. Earlier distribution of this species was restricted to northern and eastern parts of the country.

5. *Phalerimeris phalerata turneri* (Betrem, 1928)

(Plate I: Image 4)

1928. *Campsomeris (Dielis) phalerata turneri* Betrem, *Treibia*, 9 (suppl.): 104, Female, Male; Sri Lanka, southern India (new name for the misidentified female allotype of *Campsomeris ceylonica* Kirby).


**Material Examined:** 1 female, Golewadi, Sinhagad forest, Haveli, Pune, 23.11.2012, NZC, ZSI, WRC, Ent.6/225 and 1 female, Karul Ghat, Gaganbavda, Kolhapur, 17.3.2014, NZC, ZSI, WRC, Ent.6/410, coll. M.J. Jadhav.
Distribution: India: Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Maharashtra, Meghalaya, Sikkim, Tripura, Uttarakhand, and West Bengal.

Elsewhere: China, Indonesia, Malaysia, Myanmar, Nepal, Taiwan, and Thailand.

Remarks: This subspecies is first time reported from Maharashtra during present study.

6. Phalerimeris madurensis (Betrem, 1928)

Remarks: Reported from Satara district by Girish Kumar and Kazmi (2012)

7. Megacampsomeris reticulata (Cameron, 1892)

(Plate II: Image 1)


Distribution: India: Andhra Pradesh, Delhi, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Rajasthan and Tamil Nadu.

Remarks: This species is widely distributed in India.

8. Megacampsomeris cochinensis (Betrem, 1928)

(Plate II: Image 2)

1928. Campsomeris (Megacampsomeris) cochinensis Betrem, Treubia, 9 (suppl.): 80, 151. Male, Parambikulam, Kerala (holotype in Z.S.I., Culcutta)

**Remarks:** First time reported from Maharashtra. (Jadhav & Gaikwad, 2014).

9. *Liacos erythrosoma erythrosoma* (Burmeister, 1854)

(Plate II: Image 3)


**Material Examined:** 1 female, Margasani, Velhe, Pune, 7.3.2013, NZC, ZSI, WRC, Ent.6/330, coll. M.J. Jadhav.

**Distribution:** India: Arunachal Pradesh, Assam, Maharashtra, Manipur, Kerala, Sikkim, and West Bengal.

**Elsewhere:** China, Indonesia, Malaysia, Myanmar, Nepal, and Thailand.

**Remarks:** First time reported from Northern Western Ghats.

10. *Megascolia (Regiscolia) azurea hindostana* (Micha, 1927)

(Plate II: Image 4)


**Material Examined:** 1 female, Chandgad, Kolhapur, 01.08.2012, NZC, ZSI, WRC, Ent.6/397, Dr. S.M. Gaikwad; 1 female, 1 km from Diksal, on Diksal-Bhigvan road, Daund, Pune, 24.4.2014, NZC, ZSI, WRC, Ent.6/441, coll. M.J. Jadhav.

**Distribution:** India: Karnataka, Kerala, Maharashtra, and Tamil Nadu.

**Remarks:** First time reported from Northern Western Ghats and Maharashtra as well.

11. *Scolia (Discolia) affinis* (Guerin, 1838)

(Plate III: Image 1)


Distribution: India: Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Nagaland, Odisha, Pondicherry, Sikkim, Tamil Nadu, Tripura, Uttarakhanda, Uttar Pradesh, and West Bengal.

Elsewhere: Bangladesh, Myanmar, Nepal, and Pakistan.

Remarks: This is one of the most widespread and abundant scoliids of India distributed in nearly all parts of country.

12. Scolia (Discolia) bilunata (de Saussure, 1858)

(Plate III: Image 2)


**Distribution:** India: Delhi, Jharkhand, Karnataka, Maharashtra, Manipur, Odisha, Punjab, Uttarakhand, Uttar Pradesh and Tamil Nadu.

**Elsewhere:** Nepal and Sri Lanka.

**Remarks:** This scoliid is well distributed in India from north-east to south-east India as well as from western parts of country.

13. *Scolia (Discolia) binotata binotata* (Fabricius, 1804)  
(Plate III: Image 3)  

**Material Examined:** 1 Female, Panhala fort, Panhala Taluk, Kolhapur, 16/12/2012, ZSUK/2, coll. S.M. Gaikwad.

**Distribution:** India: Andhra Pradesh, Arunachal Pradesh, Assam, Delhi, Karnataka, Kerala, Maharashtra, Manipur, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh, & West Bengal.

**Elsewhere:** Sri Lanka.

**Remarks:** This scoliid is well distributed in India.

14. *Scolia (Discolia) cruenta* (Klug, 1805)  

**Material Examined:** 1 female, Near Khadakvasla water reservoir, Khadakvasla, Haveli, Pune, 9.9.2014, NZC, ZSI, WRC, Ent.6/515 coll. M.J. Jadhav.

**Distribution:** India: Bihar, Delhi, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Tamil Nadu, Uttarakhand, Uttar Pradesh, and West Bengal.
Remarks: This species is well distributed throughout India.

15. Scolia (Discolia) cyanipennis (Fabricius, 1804)

(Plate III: Image 4)


Elsewhere: Sri Lanka.

Remarks: This species is distributed throughout India.

16. Scolia (Discolia) fasciatopunctata dunensis Betrem, 1928

(Plate IV: Image 1)

1928. Scolia (Scolia) dunensis Betrem, Treubia, 9 (suppl.): 251, (key), (des.). Male, Dehra Dun, India (holotype in Z.S.I., Calcutta).


Remarks: First time reported from Western Ghats. (Jadhav et al. 2014).

17. Scolia (Discolia) picteti (Saussure, 1855)

(Plate IV: Image 2)


Distribution: India: Karnataka, Kerala, Maharashtra, Odisha, and Tamil Nadu.

Elsewhere: Sri Lanka.
Remarks: First time reported from Maharashtra as well as from Northern Western Ghats.

18. *Scolia (Discola) quadripustulata* (Fabricius, 1782)

(Plate IV: Image 3)


Distribution: India: Karnataka, Kerala, Maharashtra, Meghalaya, Sikkim, Tamil Nadu, Uttarakhand, and West Bengal.

Elsewhere: Sri Lanka.

Remarks: First time reported from Maharashtra as well as Northern Western Ghats.

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REFERENCES:


PLATE I

Figure 1: Survey localities

Figure 2: Map depicting localities for new state reports

LEGENDS:
1. *Megasaccola* (Regiscolla) azuria hindostana
2. *Phalerimeris phalerata turneri*
3. *Liacos erythrosoma erythrosoma*
4. *Megasaccola* (Regiscolla) azuria hindostana
5. *Phalerimeris phalerata turneri*
6. *Scolia* (Discchia) quadrupustulata
7. *Scolia* (Discchia) picta
8. *Campsomariella* (Annulimeris) annulata annulata
Image 1 Colpacampsomeris indica
deccanensis Gupta and Jonathan, 2003 ♀

Image 2 Campsomeriella (Campsomeriella)
collaris collaris (Fabricius, 1775) ♀

Image 3 Campsomariella (Annulimeris)
annulata annulata (Fabricius, 1793) ♂

Image 4 Phalerimeris phalerata turneri
(Betrem, 1928) ♀
PLATE II

Image 1 *Megacampsomeris reticulata* (Cameron, 1892) ♀

Image 2 *Megacampsomeris cochinensis* (Betrem, 1928) ♀

Image 3 *Liacos erythrosoma erythrosoma* (Burmeister, 1854) ♀

Image 4 *Megascolia (Regiscolia) azurea hindostana* (Micha, 1927) ♀
PLATE III

Image 1 *Scolia (Discolia) affinis* (Guerin, 1838) ♀

Image 2 *Scolia (Discolia) binotata binotata* (Fabricius, 1804) ♀

Image 3 *Scolia (Discolia) bilunata* (de Saussure, 1858) ♂

Image 4 *Scolia (Discolia) cyanipennis* Fabricius, 1804 ♀
PLATE IV

Image 1 Scolia (Discolia) fasciatopunctata dunensis Betrem, 1928

Image 2 Scolia (Discolia) picteti (Saussure, 1855) ♀

Image 3 Scolia (Discolia) quadripustulata (Fabricius, 1782) ♀