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Research Paper

Taxonomic studies on the genus *Catapicephala* Macquart (Diptera:Calliphoridae) from north-west India

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Abstract

Three species belonging to the genus *Catapicephala* Macquart have been collected from North-West India. Detailed descriptions have been written for each of them that include synonymy, morphological attributes, colouration, chaetotaxy, wing venation, illustrations of male and female genitalia, material examined distribution, holotype depository and remarks. A key to the studied species has also been provided.

Keywords: *Catapicephala*, Diptera, Calliphoridae, North-West India

Introduction

The genus *Catapicephala* is restricted to the Oriental region only. Members of this genus are robust flies, usually collected from bushes in the mountaneous areas. Kurahashi and Thapa¹ also collected the specimens from near mountain streams. According to Tumrasvin and Kano² the females are ovoviparous though not much is known about the bionomics of any species. The genus is represented by 8 species including 4 from India³⁻⁵. Only 3 species are known from North-West India that include: *C. pattoni* Senior-White *et. al.*, *C. ingens* (Walker) and *C. splendens* Macquart. Diagnostic characters of the genus include: head considerably compressed from back to front, eyes dichoptic, frons slightly protruding, bristles extending up to 2/3 of total length of parafacialia, fronto-orbital bristles present, facial carina absent, length of 3rd antennal segment up to 8X of 2nd, prosternum hairy, ventral surface of costa bare between apices of SC and R1, R4+5 setulose at basal node on both dorsal and ventral sides, subcostal sclerite with soft decumbent pubescence, legs with elongated pulvilli in male, tergites 2-4 with marginal bristles, sternites 1-5 with numerous long hair.

Results and Discussion

Catapicephala pattoni Senior-White *et al.*, 1940

Catapicephala pattoni Senior-White *et al.*, 1940. *Fauna Brit. India, Dipt.*, 6: 105.

MALE: Body length 10.0-11.5 mm.

Head : Eyes bare, dichoptic, facets uniform, ptilinal angles not strongly projecting, frons reddish-brown, parallel sided, narrower than parafrontalia, parafrontalia greyish with shining silver tomentum, hairy, frontal bristles well developed, fronto-orbital bristles present, ocellus with ocellar and postvertical bristles, vertical and outer vertical bristles present, prevertical bristles absent, parafacialia with shining silver tomentum, bare, face, jowls and medianae greyish black with shining silver tomentum, bare, facial carina absent, genae and postgenae black purplish with black hair, vibrissae present well above oral margin, peristomal bristles well developed, postorbit silvery white, bare,

occiput greyish black covered with black hair, antennae dark brown, 2nd segment with one long bristle, length of 3rd segment about 4X that of 2nd segment, arista brown, long plumose, palpi brown with bristles present all over.

Thorax: Shining bluish green with white dusting at anterior part, humerus and postalar callus concolorous with dorsum, prothoracic spiracle dark brown, propleuron bare, prosternum hairy, postalar declivity hairy, supraspiracular convexity bare, suprasquamal ridge with anterior tuft.

Chaetotaxy (Figure 4) : Acrostichals 2+2, Dorsocentrals 2+4, intra-alars 1+2, presutural present, humerals 3, posthumerals 3, supra-alars 3, post-alars 2, notopleurals 2, lateroscutellars 3, apicoscutellar and discoscutellar 1 each, sternopleurals 2+1, propleural and prostigmatic present.

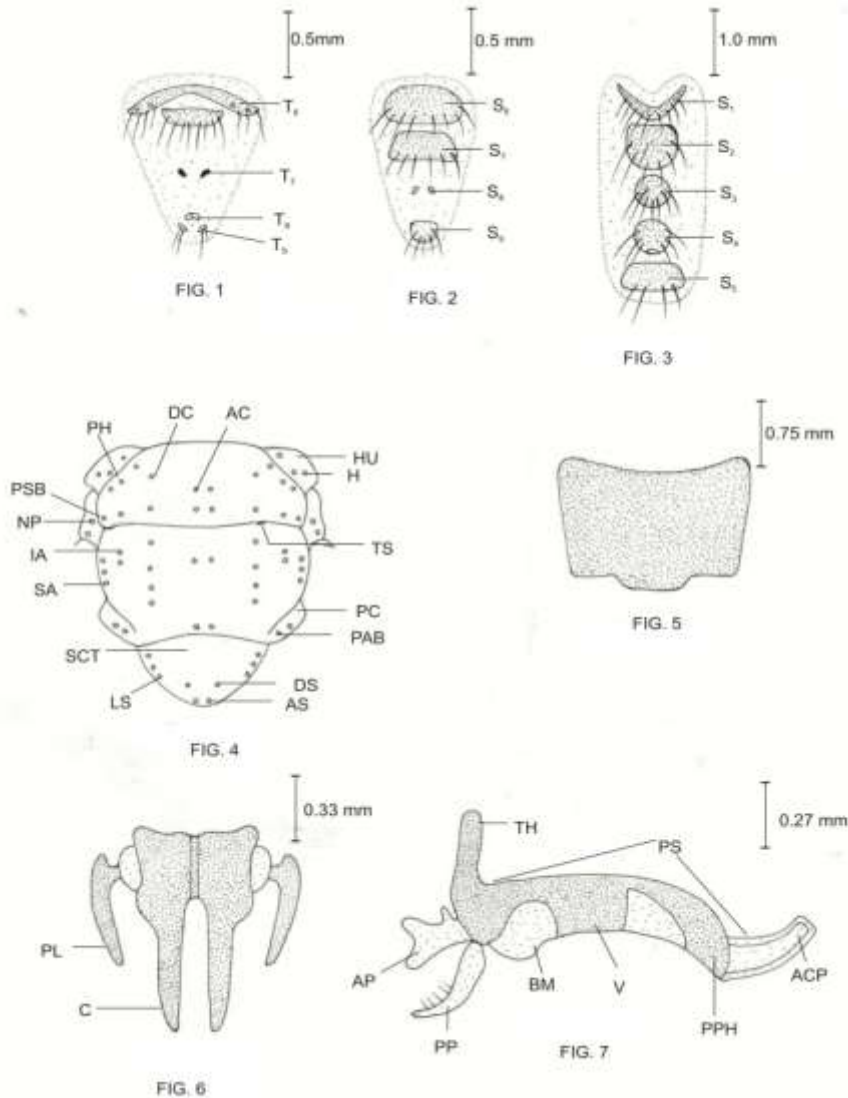


Figure: 1-7 (*Catapicephala pattoni*)

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|------------------------------|--|
| 1. Dorsal view of ovipositor | 2. Ventral view of ovipositor |
| 3. Sternites I-V of female | 4. Dorsal view of chaetotaxy of thorax (Diagramatic) |
| 5. Sternite V of male | 6. Cerci and parolobi |
| | 7. Aedeagus and parameres |

Wings : Hyaline, with yellowish tinge, stem vein (R) bare, R₁ bare, R₄₊₅ setulose at base on both dorsal and ventral sides, first posterior cell (R₅) open, epaulet and basicosta black, subcostal sclerite brown with fine pubescence, alar and thoracic squamae white, with white marginal cilia, bare, halteres yellowish brown.

Legs : Dark brown, fore- and hind femora with bristles on both dorsal and ventral sides while midfemur with bristles on ventral side only, foretibia with 1 bristles at middle and 3 at apex, mid- and hindtibiae with series of bristles.

Abdomen : Metallic bluish purple with uneven greyish dusting, tergites 2-3 with weak lateral and discal marginal bristles, tergites 4-5 with series of strong marginal bristles, sternites 1-5 with numerous long hair, hypopygium inconspicuous.

Male genitalia: Fifth sternite (Figure 5), Cerci and parolobi (Figure 6), Aedeagus and parameres (Figure 7).

FEMALE: Body length 11.0-12.0 mm.

Similar to the male except : frons much wider, prevertical bristles present, foretibia with 2 bristles at middle only, tergites 2-3 with series of strong marginal bristles, sternites 1-5 (Figure 3).

Female genitalia: Dorsal view of ovipositor (Figure 1), Ventral view of ovipositor (Figure 2)

Material examined: Uttarakhand: Mandal-1568M (2♂♂) 11-12.VI.2000, Didihat-1850M (3♂♂, 1♀) 7.VII.2001, Mussoorie-2005M (3♀♀) 8.VII.2001. Coll. Inderpal Singh Sidhu.

Distribution (Map 32): India (Uttarakhand, West Bengal), Nepal.

Holotype depository: BMNH, London, England.

Remarks: This species is closely related to *C. ingens* (Walker) and *C. splendens* Macquart from which it is differentiated on the basis of structure of external genitalia and other characters as shown in the key to species of the genus. Adults have been collected from bushes along mountain streams.

***Catapicephala ingens* (Walker, 1860)**

Musca ingens Walker, 1860. *J. Proc. Linn. Soc. Lond., Zool.*, 4: 134.

Catapicephala ingens (Walker): Senior-White et. al., 1940. *Fauna Brit. India, Dipt.*, 6: 104

MALE: Body length 12.0-13.0 mm.

Head: Eyes bare, dichoptic, facets uniform, ptilinal angles not strongly projecting, frons greyish black, narrower than parafrofrontalia, parafrofrontalia greyish black with silver tomentum, hairy, frontal bristles well developed, fronto-orbital bristles present, ocellus with ocellar and postvertical bristles and fine black hair, vertical and prevertical bristles present, outer vertical bristles absent, parafacialia, face, epistome, medianae, jowls, genae and postgenae greyish black with silver tomentum, facial carina absent, vibrissae present just above oral margin, peristomal bristles well developed, postorbit silvery white, bare, occiput greyish black, covered with black hair, 1st and 2nd antennal segments black, setulose, 2nd segment with 1 long bristle, base of 3rd segment orange, rest brown, length of 3rd segment about 6X that of 2nd segment, arista dark brown, long plumose except at tip, palpi black with bristles present all over.

Thorax: Shining bluish purple with grey dusting, humerus and postalar callus concolorous with dorsum, prothoracic spiracle dark brown, propleuron bare, prosternum hairy, postalar declivity with black bristle like hair, supraspiracular convexity with fine pubescence, suprasquamal ridge with small patch of hair.

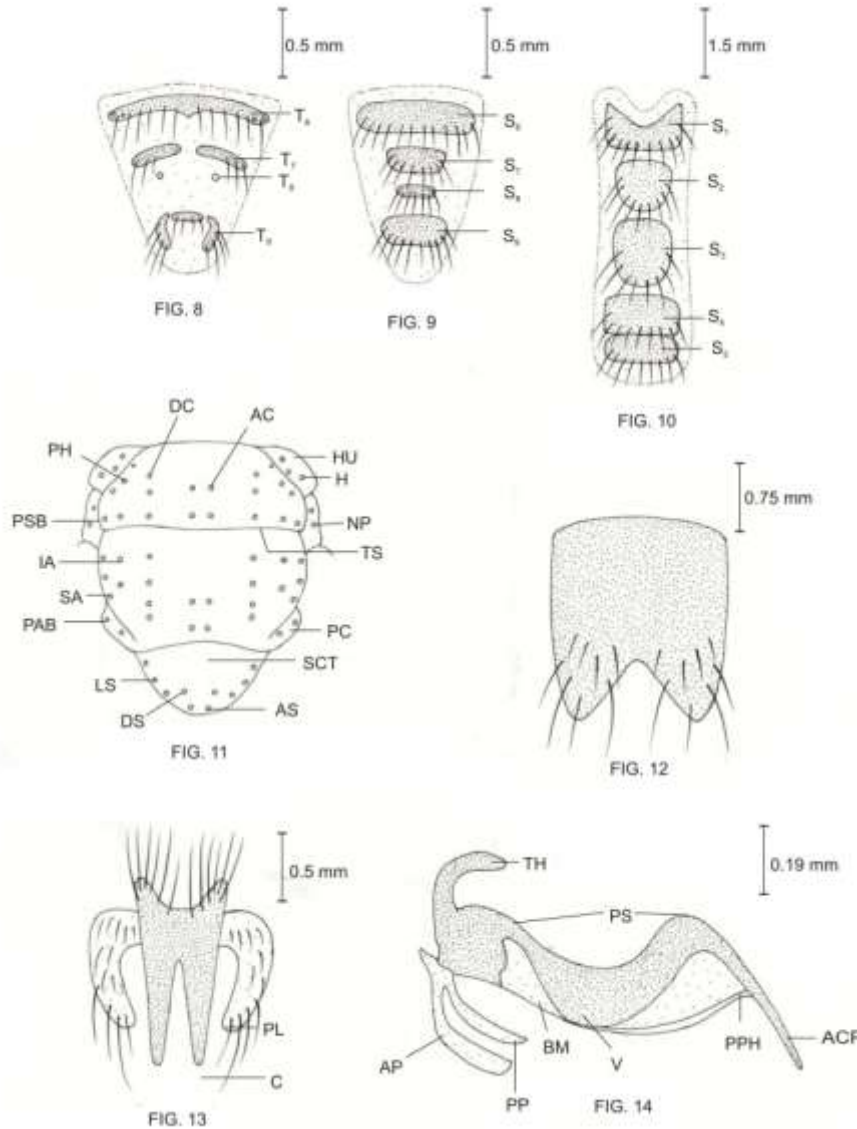
Chaetotaxy (Figure 11) : Acrostichals 2+2, dorsocentrals 3+4, intra-alars 1+2, presutural present, humerals 3, posthumerals 3, supra-alars 3, post-alars 2, notopleurals 2, lateroscutellars 3, apicoscutellar and discoscutellar 1 each, sternopleurals 2+1, propleural and prostigmatic present.

Wings: Hyaline, infuscated along anterior margin, veins brown, stem vein (R) bare, R₁ bare, R₄₊₅ setulose at base on both dorsal and ventral sides, first posterior cell (R₅) open, epaulet and basicosta black, subcostal sclerite brown with fine pubescence, alar and thoracic squamae white with faint yellow margins, bare, white hair present on ventral part of alar squama, halteres dark brown.

Legs: Black, fore- and hindfemora with bristles on both dorsal and ventral sides, midfemur with bristles on ventral side only, foretibia with 1 bristle at middle and 2 at apex, midtibia with 2 bristles at middle and 3 at apex, hindtibia with 1 bristle at middle and 2 at apex.

Abdomen : Metallic shining bluish purple, silver dusted, tergite 2 with weak lateral marginal bristles, tergite 3 with strong marginal bristles at middle and lateral side, tergites 4 and 5 with series of strong marginal bristles, sternites 1-5 with numerous long hair, hypopygium conspicuous.

Male genitalia: Fifth sternite (Figure 12), Cerci and paralobi (Figure 13), Aedeagus and parameres (Figure 14).



Figures 8-14: (*Catapicephala ingens*)

8. Dorsal view of ovipositor

9. Ventral view of ovipositor

10. Sternites I-V of female

11. Dorsal view of chaetotaxy of thorax (Diagramatic)

12. Sternite V of male

13. Cerci and paralobi

14. Aedeagus and parameres

FEMALE: Body length 13.0-15.5 mm.

Similar to the male except : frons much wider, postvertical bristles present, vertical bristles absent, outer vertical bristles present, 3rd antennal segment greyish black with base orange, humerals 5, sternites 1-5 (Figure 10).

Female genitalia: Dorsal view of ovipositor (Figure 8), Ventral view of ovipositor (Figure 9)

Material examined: Himachal Pradesh: Shimla- 2208M (1♀) 3.VII.2000, Manikaran- 1737M(2♀♀) 6.IX.2000, Kandi-2355M(4♂♂, 11♀♀) 14.IX.2000, Chamba-996M (2♀♀) 21.IX.2000. Uttarakhand : Parola-1452M (1♂, 2♀♀) 29.V.2000, Mandal-1568(1♀) 12.VI.2000. Coll. Inderpal Singh Sidhu.

Distribution: India (Himachal Pradesh, Uttarakhand), Celebes.

Holotype depository: BMNH, London, England.

Remarks: This species was known only from Celebes and was recorded from India for the first time by Singh and Sidhu⁶. It resembles *C. splendens* in the general colour pattern but the two can be easily separated as shown in the key.

***Catapicephala splendens* Macquart, 1851**

Catapicephala splendens Macquart, 1851. *Mem, Soc. Sci. Arts. Lille*, 1850: 210.

MALE: Body length 14.0-15.0 mm.

Head: Eyes bare, dichoptic, facets uniform, ptilinal angles strongly projecting, frons dark reddish brown, almost equal in width to parafrontalia, widening slightly anteriorly, parafrontalia greyish black with silver tomentum, hairy, frontal bristles well developed, fronto-orbital bristles present, ocellus with ocellar and post vertical bristles, vertical and prevertical bristles present, outer vertical bristles absent, parafacialia brownish with silver tomentum, face greyish black, bare, facial carina absent, epistome yellowish brown, medianae brown, bare, jowls, genae and postgenae greyish with black hair, vibrissae present well above oral margin, peristomal bristles well developed, postorbit greyish with silver tomentum, bare, occiput greyish black with heavy silver dusting, with grey hair, antennae dark brown, 2nd segment with a long bristle, length of 3rd segment about 4X that of 2nd segment, arista brown, long, plumose, palpi orange with bristles present all over.

Thorax: Shining metallic green, lightly grey dusted anteriorly and on pleura, humerus and postalar callus concolorous with dorsum, prothoracic spiracle brown, propleuron and prosternum hairy, postalar declivity bare, supraspiracular convexity with fine pubescence, suprasquamal ridge bare.

Chaetotaxy (Figure 18) : Acrostichals 2+3, dorsocentrals 3+4, intra-alars 1+3, presutural present, humerals 3, posthumeral 3, supra-alars 3, post-alars 2, notopleurals 2, lateroscutellars 2, apicoscutellar and discoscutellar 1 each, sternopleurals 2+1, propleural and prostigmatic present.

Wings: Greyish hyaline, infuscated anteriorly and along veins, veins brown, stem vein (R) bare, R₁ bare, R₄₊₅ setulose at basal node on both dorsal and ventral sides, first posterior cell (R₅) open, epaulet and basicosta black, subcostal sclerite dark brown with brown pubescence, alar and thoracic squamae with yellow margin and yellowish marginal cilia, halteres dull brownish.

Legs: Dark brownish, fore- and hindfemora with bristles on both dorsal and ventral sides, midfemur with bristles on ventral side only, foretibia with 2 bristles at middle and 3 at apex, midtibia with 3 bristles at middle and 1 at apex, hindtibia with 2 bristles at middle and 1 at apex.

Abdomen: Shining metallic blue, slightly silver dusted, tergite 2 with pair of strong marginal bristles, tergites 3-5 with complete row of marginal bristles, sternites 1-5 with numerous long hair, hypopygium conspicuous.

Male genitalia: Fifth sternite (Figure 19), Cerci and paralobi (Figure 20), Aedeagus and parameres (Figure 21)

FEMALE: Body length 13.0-15.5 mm

Similar to the male except: frons much wider, parallel sided, ocellar and postvertical bristles much strong, outer vertical bristles present, 3rd antennal segment with base reddish, sternites 1-5 (Figure 17).

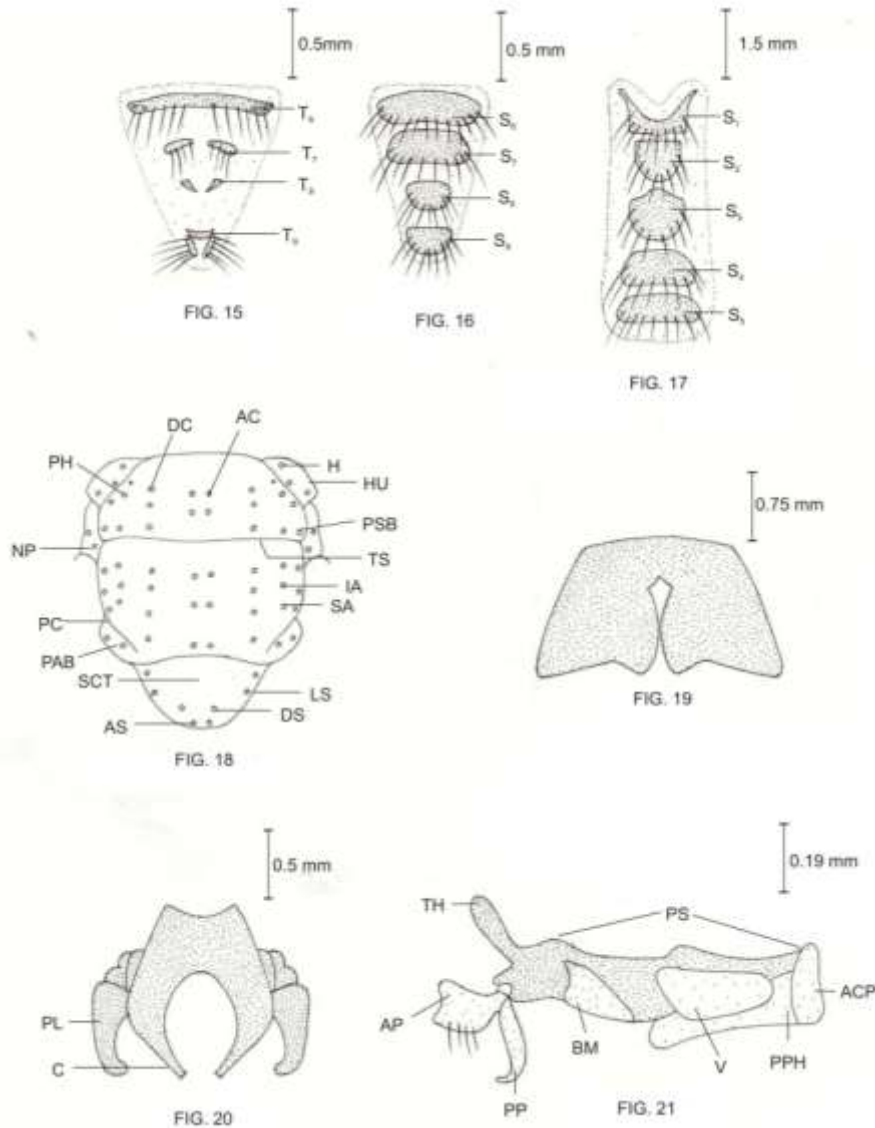
Female genitalia: Dorsal view of ovipositor (Figure 15), Ventral view of ovipositor (Figure 16)

Material examined: Himachal Pradesh: Shimla-2208 M (18♂♂, 4♀♀) 9.X.1999, Chamba-996M(2♂♂) 17.IV.2000, Manikaran-1737 M (2♂♂, 3♀♀) 7.VII.2000, Kandi-2355M (5♂♂, 13♀♀) 11.VIII.2000. Coll. Inderpal Singh Sidhu.

Distribution: India (Himachal Pradesh), Borneo, Indonesia, Malaysia, Myanmar, Singapore and China.

Holotype depository: BMNH, London, England.

Remarks: This species was reported from India for the first time by Sidhu and Singh⁷. Mainly chaetotaxy of the thorax is useful for separating it from the very closely related *C. ingens* (Walker).



Figures 15-21: (*Catapicephala splendens*)

- 15. Dorsal view of ovipositor
- 16. Ventral view of ovipositor
- 17. Sternites I-V of female
- 18. Dorsal view of chaetotaxy of thorax (Diagramatic)
- 19. Sternite V of male
- 20. Cerci and paralobi
- 21. Aedeagus and parameres

Key to the studied species of *Catapicephala* Macquart

- 1. Presutural dorsocentrals 2, palpi brown..... *C. pattoni* Senior-White et al.
- Presutural dorsocentrals 3, palpi black or orange..... 2

2. Presutural acrostichals 2, intra-alars 1+2, lateroscutellars 3, wings infuscated along anterior margin, palpi black.....**C. ingens (Walker)**
-Presutural acrostichals 3, intra-alars 1+3, lateroscutellars 2, wings hyaline, palpi orange.....**C. splendens Macquart**

References

1. Kurahashi H. and Thapa V.K., Notes on the Nepalese calliphorid flies (Insecta, Diptera). Jpn. J. Sanit. Zool., 45: 179-252 **(1994)**
2. Tumrasvin W. and Kano R., Two new species of *Catapicephala* Macquart from Thailand (Diptera : Calliphoridae). Jpn. J. Sanit. Zool., 28: 127-132 **(1977)**
3. Senior-White R., Aubertin D. and Smart J., The Fauna of British India, including the remainder of the Oriental region, Diptera Vol. VI, Family Calliphoridae, Taylor and Francis, London **(1940)**
4. James M.T., A catalogue to the Diptera of the Oriental Region Vol. III. Suborder Cyclorrhapha (Editors Delfinado and Hardy), 763 **(1977)**
5. Bharti M., An updated checklist of blowflies (Diptera: Calliphoridae) from India. Halteres., 3: 34-37 **(2011)**
6. Singh D. and Sidhu I.S., New records of blow flies (Diptera: Calliphoridae) from India. Entomon., 29(2): 203-206 **(2004)**
7. Sidhu I.S. and Singh D., Blow flies (Diptera Calliphoridae) collected from north-western region including two new records from India. Uttar Pradesh, J., Zool., 22(1): 93-95 **(2002)**