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A POPULATION SURVEY OF HANUMAN LANGURS IN THE DISTRICT OF PURULIA, WEST BENGAL

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INTRODUCTION

Field studies on the non-human primates of West Bengal has been done was by Southwick *et al.* (1964); Oppenheimer (1973, 1977); Bhuinya *et al.* (1993); Mandal (1964); Mukherjee & Gupta (1965); Mukherjee *et al.* (1986, 1995). This report deals with the information regarding distribution, abundance, social composition and status of Hanuman langur of the Purulia district, West Bengal. Two species of monkeys have been recorded from Purulia district of West Bengal; the rhesus macaque, *Macaca mulatta* and Hanuman langur, *Semnopithecus entellus*. The rhesus macaque is restricted in its distribution exclusively in the forest areas of the southwestern part of the district (Ajodhya hill), while the Hanuman langur is widely distributed in the villages, urban and semi-urban areas of the entire district. These two common primate species are found in many parts of India in almost all types of habitat, ranging from open land, high montane forest region to arid zone.

STUDY AREAS

Purulia, the southwestern district of West Bengal lies between 20°43'–23°12'N and 85°49'–86°54' E. The total area of the district is about 6259 km^2. Metalloid or non-metalloid motorable roads connect majority of the villages in the district. The topography and general characteristics of the district are those of upland on the west and swelling ridges of laterite soil in the rest of the district. Traditional agricultural could not develop due to inhospitable edaphic and climatic conditions as well as poor natural resources. Purulia is well known as a drought prone district and falls within the sub tropical, semi-arid region of the state of West Bengal and is characterized by high evaporation and low precipitation. The atmospheric temperature varies from 7°C to 46°C from winter to summer respectively. Rainfall in the district is erratic in nature, average rainfall during last 10 years is 1270 mm. Subarnarekha, Silabati, Kasai, Kumari are the main non-perennial rivers which dry up in summer.

The vegetation of the district is tropical dry deciduous in nature. The common trees are dhaw, *Anogeissus latifolia*; jam, *Syzgium cumini*; palash, *Buta monosperma*; amloki, *Phyanthus emblica*; babla, *Acacia nilotica*; mohua, *Madhuca indica*; "sidha", "kend", "kusum", "asan" etc. The sal (*Shorea robusta*) gains supremacy on the fallers lands and foot of the hills, in the plateau. The rocks and rugged steep slopes are devoid of any vegetation. The district is known for the lac production in the state.

METHODS

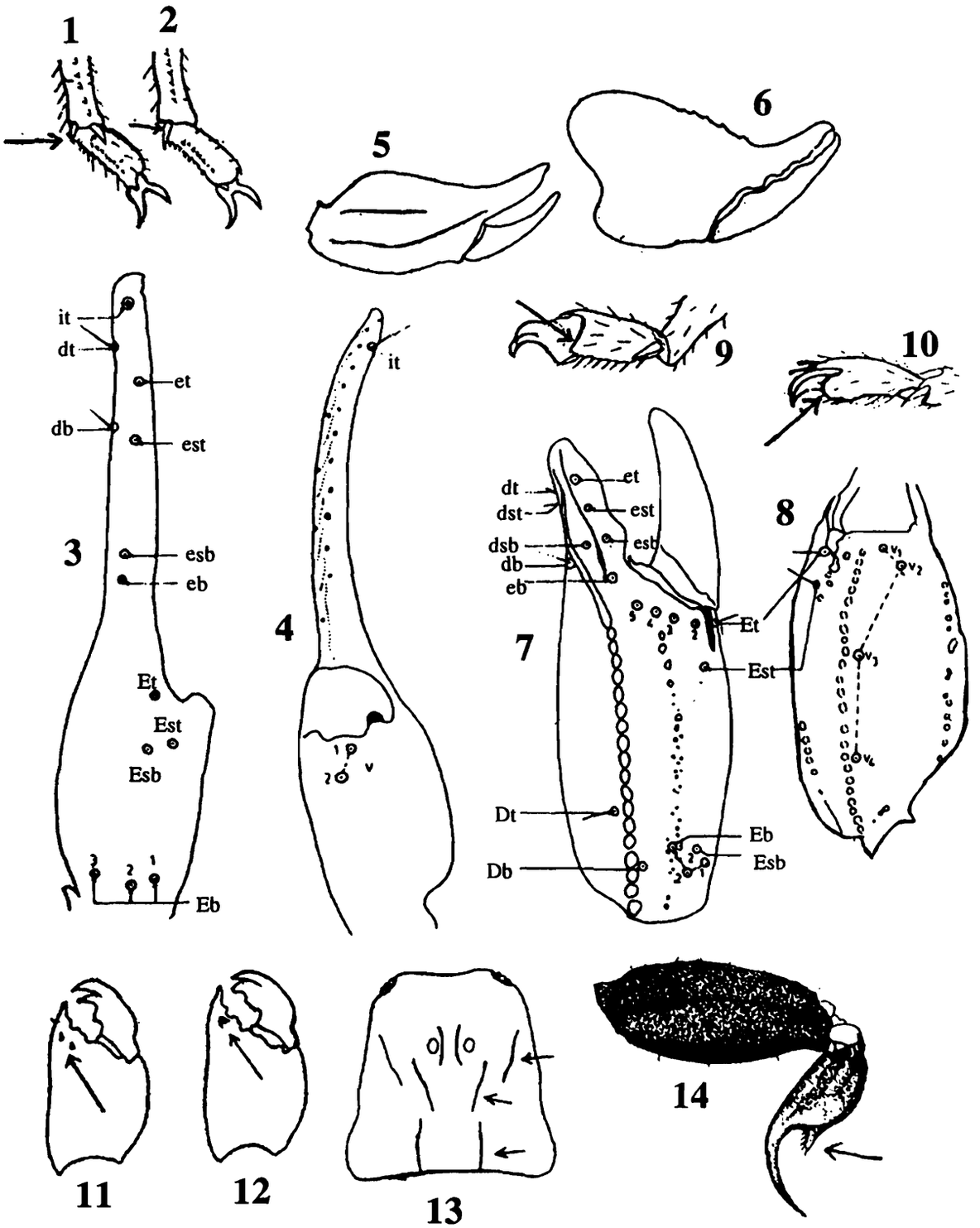
The survey techniques used here involved slow driving vehicle along open roads at an average speed of 20 km per hour. Motorable roads link almost majority of the villages of Purulia district. The surveys were done from 0700 to 1130 hours and from 1500 to 1800 hours, with four observers. The survey trips were made during September 2002, February 2003 and repeated the entire area in September 2003. A total of 300 hours were spent in the census work. About 1200 km road with 500 m stretch on either side of the road including villages, markets, fields, orchards, gardens, towns etc were surveyed. Thus one-kilometer linear distance survey is equivalent to 1 sq. km. Total count and sweep sampling methods were used to estimate the population.

The visual and auditory signals were utilized for locating the groups and villagers were also inquired about the presence of monkey groups. On locating the group, notes on their social composition, habitat and interactions with human were recorded. Individuals were classified into 4 broad categories based on the morphological differences and age, *viz.*, adult males > 4 years, adult females > 3 years, juveniles 18–24 months and infants < 18 months. In some groups individuals could not be sexed due to quick disappearance in the undulating forest terrain.

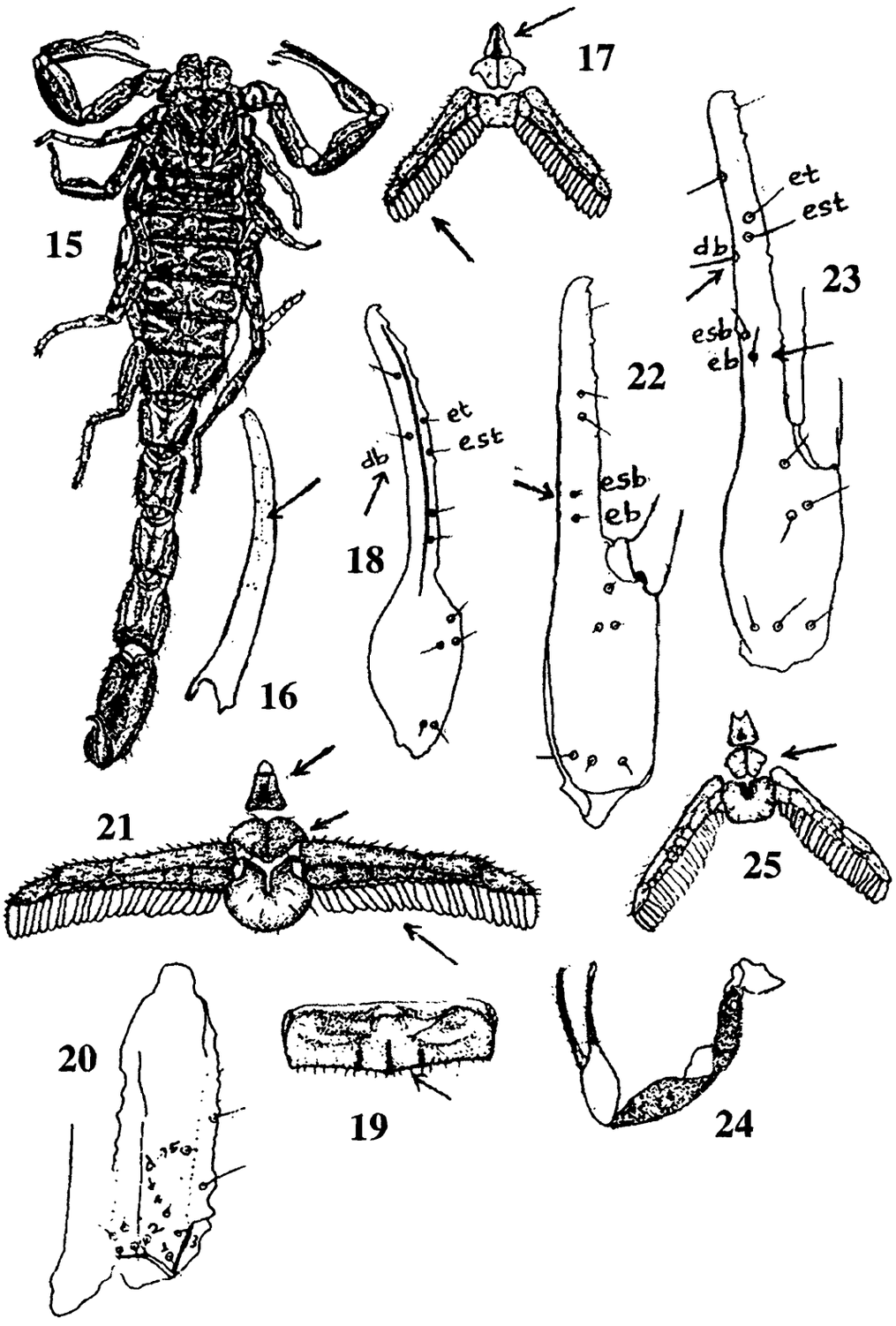
RESULTS

Results from the survey revealed the sighting of 56 groups of hanuman langur, of which 7 were all male groups, 2 groups of unclassified sexes and rests 47 were bisexual groups. The 56 groups contained 839 langurs, of which 120 adult males. 387 adult females; 149 juveniles; 163 infants and 20 unclassified sexes. The group size varied from 2 to 36. The distribution of hanuman langur is shown in Fig. 3. This gives a population estimate of 0.046 groups per sq. km and 0.70 individuals per sq. km respectively.

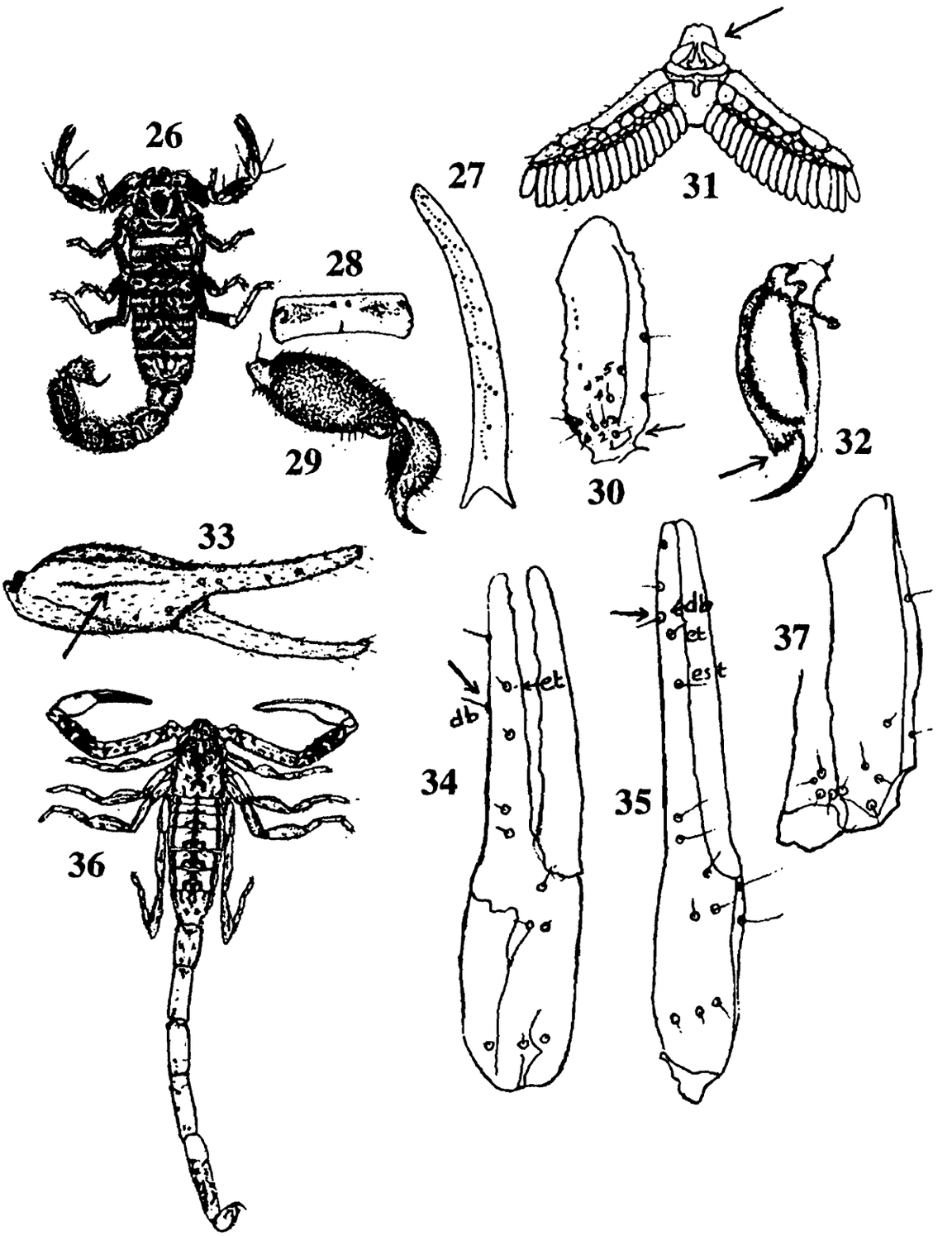
The 7 all male group contained 41 monkeys. Of the 7 all male group, 5 groups containing 33 langurs inhabited on the northern part of the districts remaining 2 groups with 8 langurs inhabited on the southern part. These langurs found inhabiting the northern parts were found close to the bisexual groups in the villages. The 2 unclassified groups of 20 individuals were recorded at the northeastern part of the district. The individual counts were not possible due to rapid disappearance.



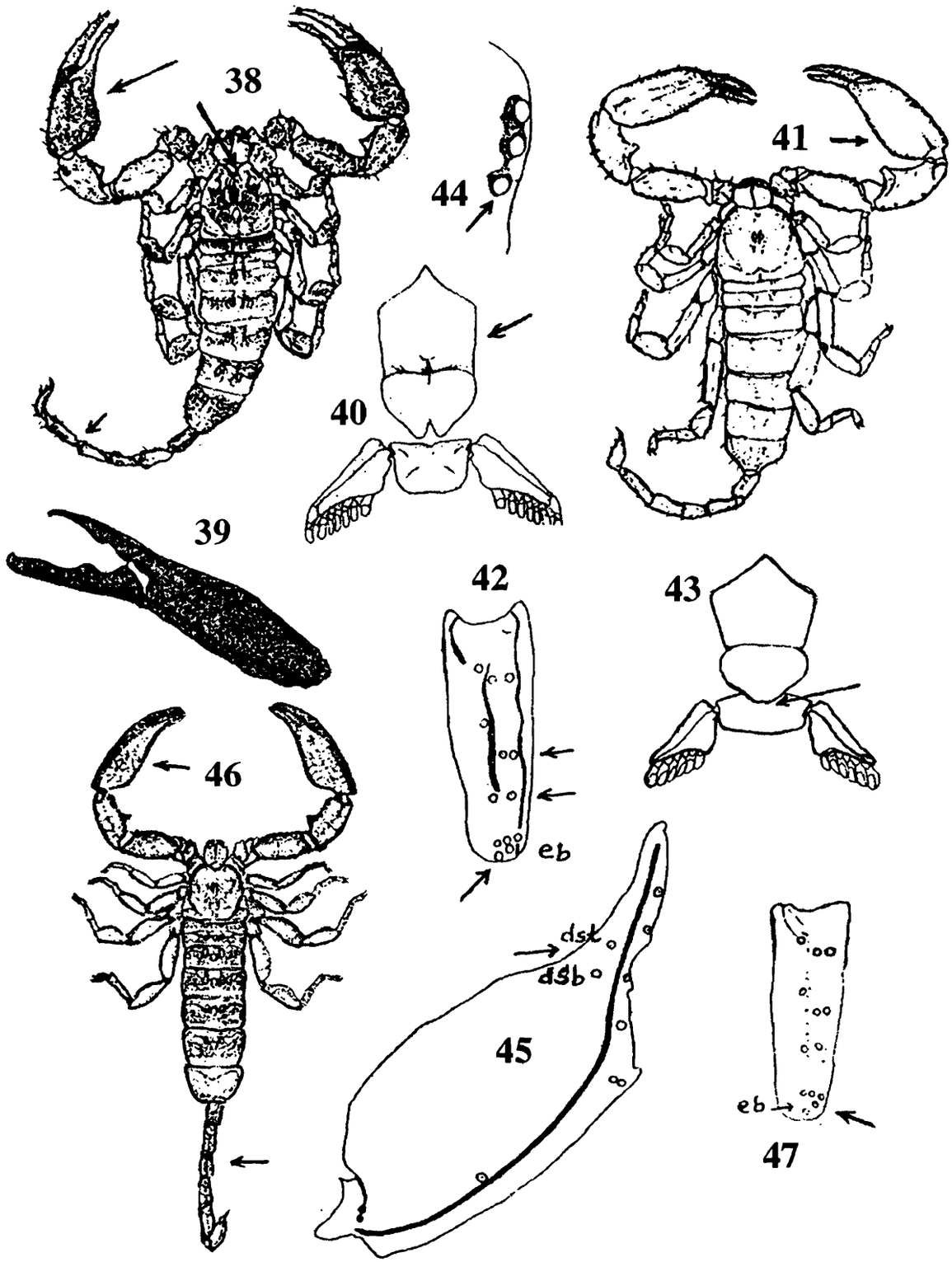
Figs. 1-14. Distal portion of tarsomere I. 1. with a pair of pedal spurs (family Buthidae); 2. with single pedal spur (families Ischnuridae and Scorpionidae). 3-4. Manus and immovable finger of pedipalp with 'A' type trichobothrial pattern (family Buthidae) 3. dorsal view; 4. ventral view. 5-6. Manus and hand of pedipalp : 5. flat, in Ishnuridae 6. not flat in Scorpionidae. 7-8. Manus and immovable finger of pedipalp with 'C' type trichobothrial pattern (families Ischnuridae and Scorpionidae) 7. dorsal view; 8. ventral view. 9-10. Lateral view of tarsomere II of leg : 9. family Ischnuride, 10. family Scorpionidae. 11-12. Ventral view of chelicera : 11. with two teeth on immovable finger, 12. with single tooth on immovable finger. 13. Carapace of *Lychas dorsal view* 14. *Lychas (Alterotrichus) hendersoni* : Telson and anal rim of mteasomal segment V lateral view



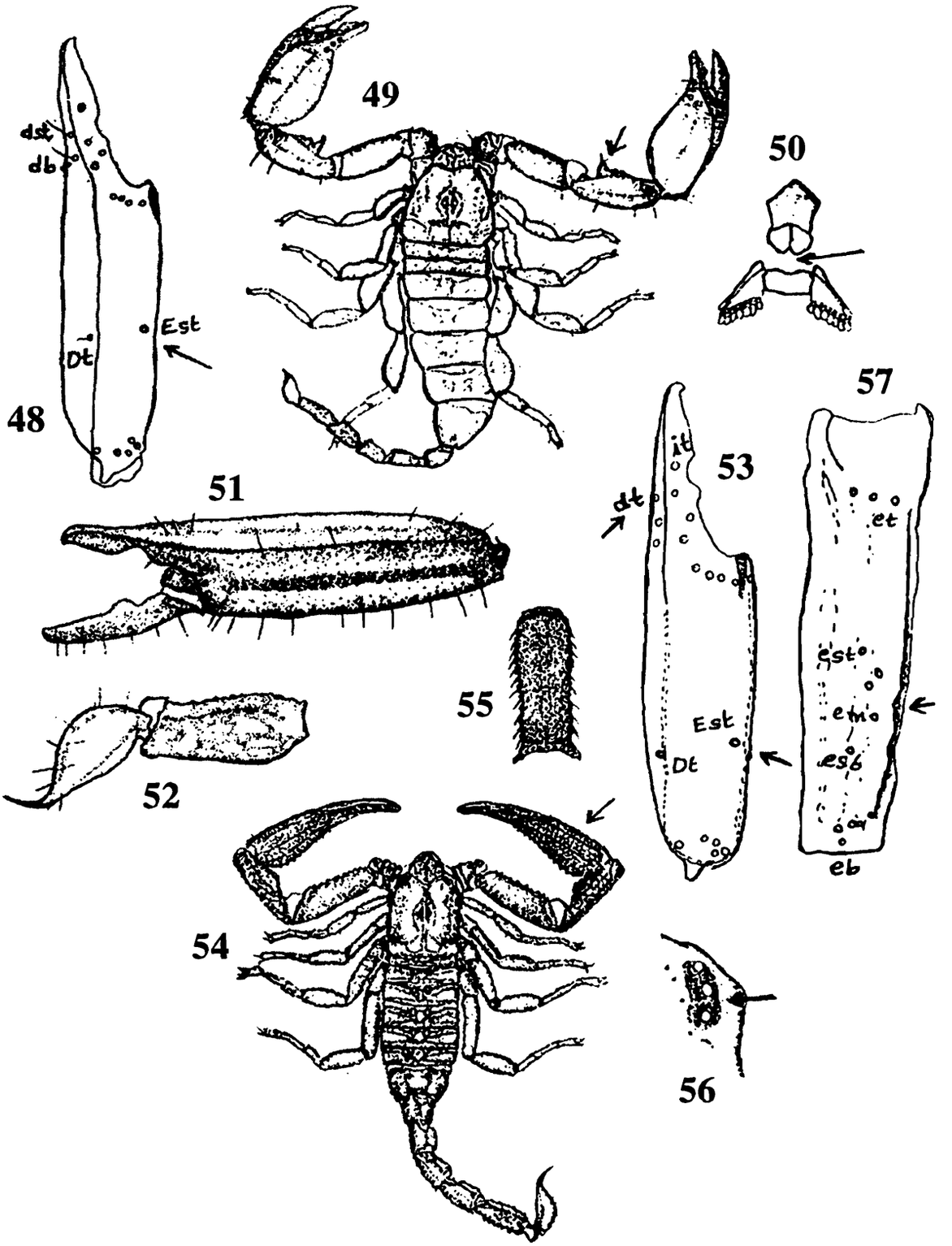
Figs. 15-25. *Lychas (Alterotrichus) hendersoni* female : 15. dorsal view; 16. movable finger of pedipalp dorsal view; 17. pectines, genital operculum and cephalothoracic sternum ventral view, 18. manus and immovable finger of pedipalp dorso-exterior view. showing trichobothria 19-22. *Lychas (Endotrichus) tricarinatus* female; 19. tergite dorsal view; 20. femur of pedipalp dorsal, interior and exterior views showing trichobothria; 21. pectines, genital operculum and sternum ventral view. 23-25. *Lychas (Endotrichus) albimanus* female : 23. manus and immovable finger of pedipalp dorsal view showing trichobothria; 24. pedipalp dorsal view; 25. pectines, genital operculum and sternum ventral view.



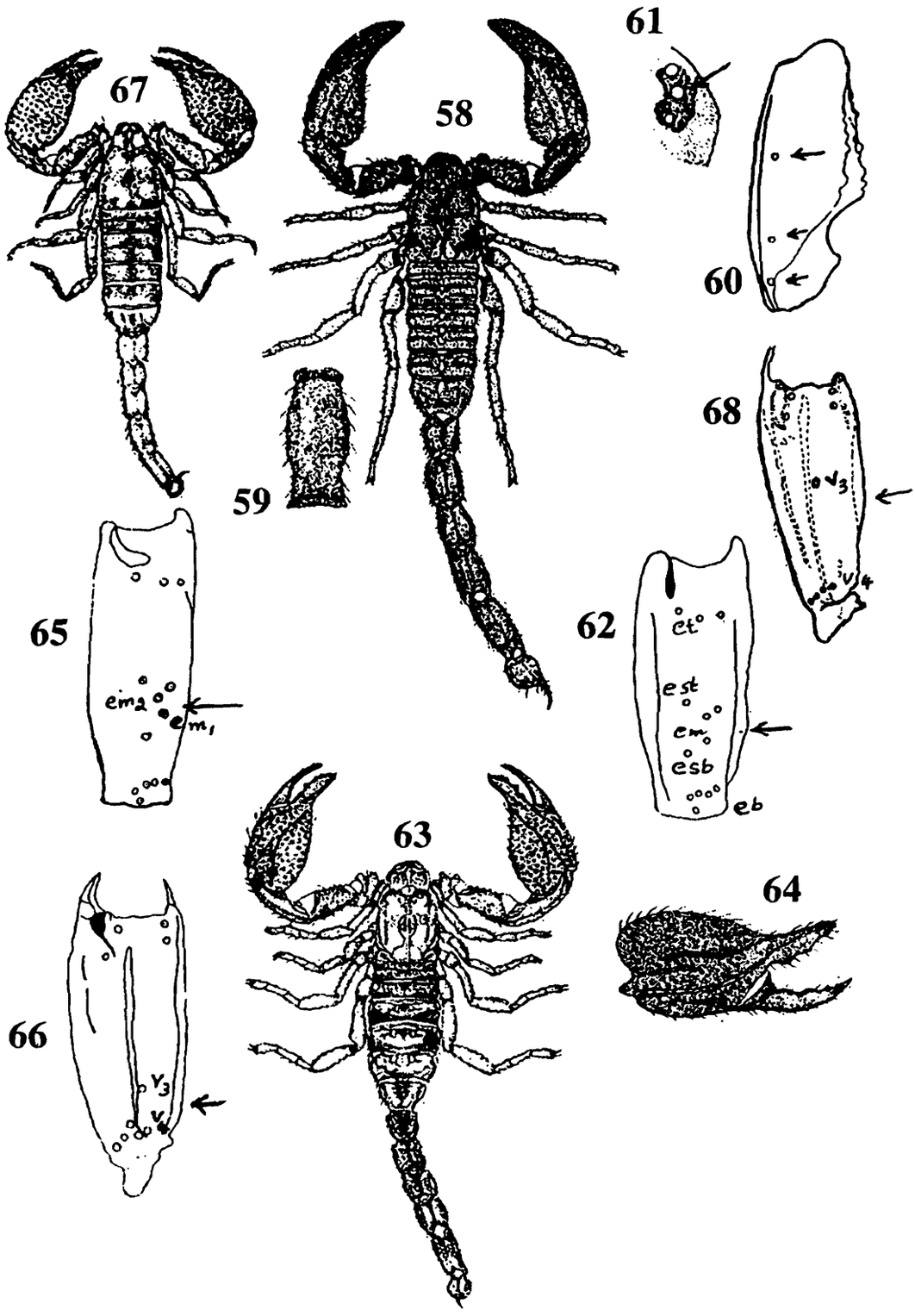
Figs. 26-37. *Charmus indicus* male : 26. dorsal view; 27. movable finger of pedipalp dorsal view; 28. tergite dorsal view; 29. telson and metasomal segment V lateral view; 30. femur of pedipalp dorsal, interior and exterior views showing trichobothria; 31. pectines, genital operculum and sternum, ventral view.32-34. *Isometrus (Reddyanus) brachycentrus* female : 32. telson and anal rim of metasomal segment V lateral view; 33. manus and fingers of pedipalp exterior view; 34. manus and fingers of pedipalp exterior view showing trichobothria. 35-37. *Isometrus (Closotrichus) sankeriensis* female; 35. manus and fingers of pedipalp exterior view showing trichobothria; 36. body dorsal view; 37. femur of pedipalp dorsal, interior and exterior views showing trichobothria.



Figs. 38-47. *Chiromachetes fergusoni* female : 38. dorsal view; 39. manus and fingers exterior view; 40. pectines, genital operculum and sternum ventral view. 41-45. *Liocheles laeviceps laeviceps* female : 41. dorsal view; 42. patella of pedipalp exterior view showing trichobothria; 43. pectines, genital operculum and sternum ventral view; 44. lateral eyes lateral view; 45. manus and immovable finger of pedipalp dorsal view showing trichobothria.46-47. *Liocheles laeviceps malabarensis* female : 46. dorsal view; 47. patella of pedipalp exterior view showing trichobotrhia.



Figs. 48-57. *Liocheles laeviceps malabarensis* female, manus and immovable finger of pedipalp exterior view. 49-53. *Hormurus australasiae* male : 49. dorsal view; 50. pectines, genital operculum and sternum ventral view; 51. manus and fingers exterior view; 52. telson and metasomal segment V lateral view; 53. manus and immovable finger of pedipalp exterior view showing tricobothria. 54–57. *Heterometrus (Heterometrus) keralaensis* male : 54. dorsal view; 55. metasomal segment V ventral view; 56. lateral eyes lateral view; 57. patella of pedipalp exterior view showing trichobothria.



Figs. 58-68. *Heterometrus (Heterometrus) malapuramensis* male : 58. dorsal view; 59. metasomal segment V ventral view; 60. patella of pedipalp ventral view showing trichobothria; 61. lateral eyes lateral view; 62. patella of pedipalp exterior view showing trichobothria. 63-66. *Heterometrus (Srilankametrus) gravimanus* male : 63. dorsal view; 64. manus and fingers exterior view; 65. patella of pedipalp exterior view showing trichobothria; 66. manus of pedipalp ventral view showing trichobothria.67-68. *Heterometrus (Chersonesometrus) granulomanus* male : 67. dorsal view; 68. manus of pedipalp ventral view showing trichobothria.