THE FAUNA OF BRITISH INDIA,

INCLUDING

CEYLON AND BURMA.

Published under the authority of the Secretary of State for India in Council.

EDITED BY W. T. BLANFORD.

ARACHNIDA.

BY

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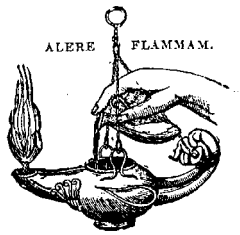
LONDON:
TAYLOR AND FRANCIS, RED LION COURT, FLEET STREET.

CALCUTTA:
THACKER, SPINK, & CO.

BOMBAY:
THACKER & CO., LIMITED.

BERLIN:
R. FRIEDLÄNDER & SOHN, 11 CARLSTRASSE.

1900.



PRINTED BY TAYLOR AND FRANCIS,
RED LION COURT, FLEET STREET.

PREFACE.

This volume contains descriptions of all the species of Arachnida of the orders Scorpiones (Scorpions), Uropygi (Whip-Scorpions), Amblypygi, Solifugæ, and of most of the larger and otherwise conspicuous species of Araneæ (true Spiders) known to occur in British India, Burma, and Ceylon, together with diagnoses of the genera, families, and suborders into which they fall. The only innovation introduced into the usually accepted classification of these groups is the ordinal separation of the Uropygi and Amblypygi, which are generally united as one order Pedipalpi.

All the described species of the first four orders are dealt with in full. The Araneæ, however, are less thoroughly treated, only the larger forms being included in the present work. These embrace all the Mygalomorphæ, a group comprising the species commonly known as "Mygales" and Trap-door Spiders, all of which are of medium or large size, and also a relatively small number of the described species of Arachnomorphæ. This latter group contains a vast number of species and is still very imperfectly known—so imperfectly that no satisfactory account of it can at present be given. All that has been attempted is to afford means of identifying the larger, commoner, better known and more widely distributed forms. As regards size no species which when adult falls short of 5 mm. in total length has been

included, and a preference has been given to those forms of which specimens were available for description. It is to be hoped that the present work, by facilitating the study of Indian Spiders, will increase the number of observers and collectors, so that at some future time a far more complete account of these animals may become practicable.

I welcome this opportunity of expressing my grateful acknowledgments to those who have rendered the work possible by lending or collecting specimens : to Major Alcock, I.M.S., Superintendent of the Indian Museum, Calcutta, for the loan of typical examples of species described by Stoliczka and Simon, and to Dr. R. Gestro for extending to me the same kindness in connection with types of species described by Thorell and preserved in the Museo Civico at Genoa. The help that I have received from many friends and strangers, too numerous to thank in detail, is acknowledged in the following pages. Especially am I indebted to Mr. R. C. Wroughton, of the Indian Forest Service, and to Mr. H. M. Phipson, Honorary Secretary of the Bombay Natural History Society, whose influence and energy in procuring material have vastly increased our knowledge of Indian Arachnology.

R. I. POCOCK.

October 16th, 1900.

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SYSTEMATIC INDEX.

CORRIGENDUM. (Pp. 206–207.)

Sections a^5, b^5, a^6, b^6 of Synopsis to be altered as follows :—

a^5. Posterior spinners absent or much shorter than anterior.

a^6. Upper lip membranous; maxillæ without crest on upper side ..... *Zodariidæ.*

b^6. Upper lip horny; maxillæ with crest on upper side ..... *Palpimanidæ.*

b^5. Posterior spinners present, not perceptibly shorter than anterior.

ARACHNIDA.

THE Arachnida may be distinguished from the Hexapoda (Insects), Chilopoda (Centipedes), and Diplopoda (Millipedes) by the entire absence of the pair of feeler-like appendages, known as antennæ, which are affixed to the front of the head in these three classes of animals, and also by the fact that there is no differentiated head furnished with two or three pairs of appendages modified so as to act solely as jaws. In the remaining great class of Arthropoda—the Crustacea,—which possesses numerous terrestrial species, there are two pairs of antenniform appendages at the anterior end of the body and at least three pairs of appendages modified as jaws.

The Arachnida may be characterized in detail as follows *:—

Arthropodous animals in which the body in the adult is never composed of more than eighteen segments (*somites*) and is divisible into two main regions—an anterior or cephalothorax, and a posterior or abdomen.

The *cephalothorax* consists of six somites, each of which is provided with a pair of appendages. The somites are usually welded together and covered above by a dorsal shield or *carapace*; rarely the posterior two somites remain distinct from the others, and are furnished with one or two dorsal plates, separate from the main portion of the carapace. The carapace is then said to be segmented. The ventral surface of the cephalothorax is typically supplied with one or more median plates (*sterna*); sometimes the sterna are partially or wholly obliterated by the ingrowth of the basal segments of the appendages, which meet in the median ventral line. Sometimes the sternal plates are united, and form a single ventral plate to the cephalothorax.

Eyes.—Except in some degenerate forms, the fore part of the carapace, sometimes called the cephalic or head-region, is furnished with simple eyes, which in undegenerate species are usually eight in number, two being situated close together in the middle line (*median eyes*), and three on each side (*lateral eyes*), set in a cluster or separated from each other.

Mouth.—The mouth is a minute aperture placed near the lower part of the anterior extremity of the cephalothorax. It is bordered above by a membranous or horny upper lip (*labrum*), and usually below by the anterior sternal plate which acts as a lower lip or *labium*.

* Some of the degenerate Mites and Ticks furnish exceptions to many of the characters contained in this definition.

Appendages.—The appendages forming the first pair (*mandibles, chelicerœ*) are situated close together beneath the front edge of the carapace above the mouth. Each consists of two, rarely of three, segments, and is very frequently pincer-like or chelate, the terminal segment (*movable finger* or *digit*) closing against a prolongation of the penultimate segment. This prolongation is called the *immovable finger*. In other cases the terminal segment closes against the penultimate segment without the interposition of a finger-like prolongation. The appendages forming the second pair (the *palpi* or *chelœ*) are usually large, but are very variable in function and form, being sometimes prehensile and pincer-like, when they are termed *chelœ*, sometimes tactile and leg-like, when they are termed *palpi*. Each typically and almost invariably consists of six segments, which, although strictly homologous throughout the class, have unfortunately in descriptive works received different names in different orders, largely on account of the failure of authors to recognize this homology. The basal segment is termed the *coxa*, or, when it acts as a masticator of food, the *maxilla*. It is often furnished with a process, the *maxillary process*, which projects forwards beneath or on one side of the mouth. The second segment is termed the *trochanter*; the third the *femur* or *humerus*; the fourth the *tibia* or *brachium* when the limb is chelate, or *patella* when it is pediform; the fifth and sixth are termed respectively *hand* and *movable finger* in the former case, *tibia* and *tarsus* in the latter. To the tip of the sixth is typically affixed a *claw*, which may be either freely movable or fused to the segment and scarcely distinguishable from it. The remaining four pairs of appendages, spoken of collectively as the *legs*, are generally similar or subsimilar in form and subserve locomotion. The first of these four pairs, however, sometimes acts as a tactile organ, and is not used for progression but is carried raised from the ground. Typically these limbs consist each of seven segments, named from base to apex as follows: *coxa*, *trochanter*, *femur*, *patella*, *tibia*, *protarsus*, *tarsus*. The tarsus is tipped with two or three claws, rarely with one, and may be secondarily subdivided into two or more segments.

Abdomen.—The abdomen is generally without appendages. When present they are of small size, are set apart for purposes of reproduction and silk-spinning, and are never used for locomotion. The abdomen is either distinctly segmented, being furnished above with a series of dorsal plates (*terga*) and below with a corresponding series of ventral plates (*sterna*); or no such plates are developed, and the visible external signs of segmentation are either wanting or obscure. At most there are twelve distinct somites in this region, though sometimes there is a skeletal piece movably articulated to the last, above the anal aperture. When this structure is present, the last segment and two or more of those that precede it are narrowed and form with the postanal sclerite the so-called *tail*. Both terga and sterna of the abdomen are generally pitted with a pair of scars (*sigilla* or *impressions*) which mark the point of attachment of a series of internal dorso-ventral muscles.

Internal organs.—The *generative organs* open upon the ventral side of the first or second abdominal somite, beneath either the sternum or a movable plate, the *genital operculum*. The *respiratory organs* also open upon the ventral side of the abdomen, communicating with the exterior by means of apertures (*stigmata*) situated upon or behind some of the anterior sternal plates. Rarely there is a pair of stigmata on the ventral side of the cephalothorax. The organs themselves consist either of horny branching tubes, the *tubular trachea*, or of *pulmonary sacs* supplied with fine leaf-like lamellæ.

The Arachnida are viviparous or oviparous. The young are born or hatched from the egg in a form substantially resembling their parents, and, except in the case of the Acari (Mites and Ticks), growth is not accompanied by metamorphosis, the characters of the adult being gradually assumed with each successive moult of the integument.

Classification.—Setting aside the marine form *Limulus*, and also the two degenerate groups *Tardigrada* and *Pentastomida*, whose claims to be regarded as Arachnida are somewhat slender, the members of this class may be grouped into the following orders :— 1. SCORPIONES; 2. UROPYGI; 3. AMBLYPYGI; 4. ARANEÆ; 5. SOLIFUGÆ; 6. PALPIGRADI; 7. PSEUDOSCORPIONES; 8. OPILIONES; 9. ACARI *. With the exception of the *Palpigradi*, which, so far as is known, are confined to Central and South Europe, all these orders are represented by numerous species and genera in British India. They may be briefly diagnosed as follows :—

a. Abdomen very long, consisting of twelve distinct somites, of which the posterior five are narrowed and compressed to form, with the postanal sclerite or vesicle, a distinct tail; postanal sclerite with two poison-glands; a pair of comb-like abdominal appendages ..... *SCORPIONES.*

b. Abdomen typically short, usually not 'tailed,' at most the posterior three somites narrowed to form a short movable stalk to support the postanal sclerite; the latter never provided with poison-glands; no comb-like abdominal appendages.

*a*¹. Postanal sclerite retained as a single unsegmented piece or in the form of a many-jointed flagellum supported by the posterior three segments of the abdomen, which are narrowed to form a movable stalk ..... *UROPYGI.*

* The subclasses and superordinal groups under which these orders have been rightly arranged are, for the sake of simplicity ignored in this volume.

b^1. Postanal sclerite absent; posterior abdominal somites not narrowed to form a movable stalk or tail.

a^2. A deep constriction separating the cephalothorax and abdomen, these regions united by a narrow waist or pedicel; a pair of breathing-organs, almost invariably in the form of lung-sacs, forming a transverse line with the median generative aperture *; sternal area of cephalothorax large, usually subcircular.

a^3. Appendages of 2nd pair spiny, prehensile and subchelate, unlike the legs; those of 3rd pair (1st pair of legs) very long, antenniform, distally many-jointed: abdomen distinctly segmented, without spinning mamillæ; no poison-gland in mandible ..... *AMBLYPYGI.*

b^3. Appendages of 2nd pair pediform, not prehensile and not subchelate, modified in male as reproductive organ: appendages of 3rd pair like the following pairs and constituting the first pair of walking-legs; abdomen usually unsegmented, always furnished with appendages in the form of spinning mamillæ; poison-gland in mandible ..... *ARANEÆ.*

b^2. No deep constriction forming a narrow waist between cephalothorax and abdomen; breathing-organs always in the form of tubular tracheæ, the first pair on the abdomen, never situated in a transverse line with the generative orifice; coxæ of cephalo-thoracic limbs in contact or separated by a forward prolongation of the anterior abdominal sternite bearing the generative orifice.

a^4. Body elongate; abdomen consisting of from 10–12 somites; generative aperture situated well behind the coxæ of the last pair

* Except in the spiders of the genus *Tetragnatha*.

of cephalothoracic limbs: coxæ of posterior four thoracic limbs in contact.

a^3. Carapace distinctly segmented: mandible articulated to the sides of its anterior plate; appendages of 2nd pair leg-like and tactile. Of large size ..... *SOLIFUGÆ.*

b^3. Carapace not segmented, merely transversely grooved; mandibles not articulated to the carapace; appendages of the 2nd pair chelate, like those of the Scorpions. Of small size. *PSEUDOSCORPIONES.*

b^2. Body short; abdomen either unsegmented or consisting of only five somites: generative aperture thrust forwards between the coxæ of the cephalothoracic limbs.

a^6. Abdomen segmented; mouth-parts not modified to form a suctorial proboscis ..... *OPILIONES.*

b^6. Abdomen not segmented: mouth-parts usually modified to form a suctorial proboscis.. *ACARI.*

The present volume deals with the Scorpiones, Uropygi, Amblypygi, Solifugæ, and with the larger or otherwise conspicuous species of Araneæ (Spiders).

The Acari (Mites and Ticks) are not likely to be mistaken for any other order. The Opiliones (Harvest Spiders), sometimes called Phalangidea, are, however, frequently confounded with the true Spiders; and the Pseudoscorpiones (False or Book-Scorpions) are often similarly regarded as diminutive Scorpions. Nevertheless, the key to the orders given above will enable naturalists and collectors to refer any Indian arachnid to its proper systematic position in the Class.

Order SCORPIONES.

Integument horny, smooth or granular, usually scantily clothed in parts with short tactile hairs, which are generally longer on the legs and tail than on the trunk. On the segments of the chelæ the hairs are often long and bristle-like, and emerge from circular integumental pits with a thickened rim. The number and position of these pits, known as *setal*, *setiferous*, or *bristle pores*, are often of systematic importance.

Carapace unsegmented and furnished near its centre with a