List of figures and photographs:

Fig.1.1A: Dorsal view of *Heterometrus xanthopus* (Pocock) (Scorpionidae).
Fig.1.1B: Ventral view of *Heterometrus xanthopus* (Pocock) (Scorpionidae).
Fig.1.2A: Dorsal view of *Orthochirus bicolor* (Pocock) (Buthidae).
Fig.1.2B: Ventral view of *Orthochirus bicolor* (Pocock) (Buthidae).
Fig.3.1: Map of Pune district, showing scorpion collection sites.
Fig: 3.2 (A & B): Collection site of *H. xanthopus* with peculiar shape of burrow.
Fig: 3.2 (C to F): Method of digging and collection of *H. xanthopus*.
Fig: 3.3 (A & B): Collection site of *O. bicolor* and measurement of stone.
Fig.3.4 (A & B): Laboratory maintenance of *H. xanthopus*.
Fig.3.6: Method of pinning of specimen during dissection.
Fig. 4A.1: Camera lucida diagram of anatomy of nervous system of *H. xanthopus*.
Fig. 4A.2 A, B: Camera lucida diagrams of brain of *H. xanthopus*.
Fig.4A.3: Camera lucida diagrams of peripheral nerve innervations to chelicera, pedipalp, telson, leg, genital operculum and pectine.
Fig.4A.4: Sagital section of cephalothoracic mass of *H. xanthopus*.
Fig.4A.5: Transverse section passing through the protocerebrum of *H. xanthopus*.
Fig.4A.6: Sagital section of brain of *H. xanthopus* passing through the tritocerebrum.
Fig.4A.7: Dorso-lateral oblique section of brain of *H. xanthopus* passing through the sub-oesophageal ganglion.
Fig. 4A.8: L.S. of the first mesosomal ganglion of *H. xanthopus*.
Fig. 4A.9: L.S. of the distal portion of seventh ganglion of *H. xanthopus*.
Fig. 4A.10: L.S. of the seventh ganglion of *H. xanthopus*.
Fig. 4A.11: Longitudinal section of double ventral nerve cord.
Fig. 4B.1: (A & B) Photograph and camera lucida diagram of male reproductive system of *H. xanthopus*.
Fig. 4B.2: T.S. of testis of *H. xanthopus*.
Fig. 4B.3: T.S. of testis of *H. xanthopus*, showing lobule containing spermatogonia.
Fig. 4B.4: T.S. of testis of *H. xanthopus*, showing lobules of spermatids.
Fig. 4B.5: T.S. of testis of *H. xanthopus* along with spermatids and sperm heads.
Fig.4B.6: Photograph showing sperm packets of *H. xanthopus*.
Fig.4B.7A: Photograph showing individual sperms along with nutrient.
Fig.4B.7B: Photograph of mature sperm of *H. xanthopus*.
Fig.4B.8: L.S. of vesicula seminalis of *H. xanthopus*. 
**Fig. 4B.9:** T.S. of the capsular region of ejaculatory sac of *H. xanthopus.*

**Fig. 4B. 10 A:** Photograph of paraxial organ of *H. xanthopus.*

**Fig. 4B. 10: B-E:** L.S. of the ejaculatory sac of paraxial organ of *H. xanthopus.*

**Fig. 4C.1:** (A & B) Photograph and camera lucida diagram of female reproductive system of *H. xanthopus,* showing development of follicles in the month of June.

**Fig. 4C.2:** (A & B): Photograph and camera lucida diagram of female reproductive system of *H. xanthopus,* showing development of diverticulum and appendix in the month of July and August.

**Fig. 4C.3:** (A & B): Photograph and camera lucida diagram of female reproductive system of *H. xanthopus,* showing enlargement of diverticulum with broad portion of appendix in the months September to November.

**Fig. 4C.4:** Camera lucida diagram of female reproductive system of *H. xanthopus,* showing broad portion of diverticulum and elongated appendix in the months December to February.

**Fig. 4C.5:** Camera lucida diagram of female reproductive system of *H. xanthopus,* showing knob like portion of diverticulum and thin short appendix observed in the month of March and April.

**Fig. 4C.6:** Photograph of female reproductive system of *H. xanthopus* observed in the month of last week of April.

**Fig. 4C.7:** Photograph showing developing embryo observed after removal of coverings.

**Fig. 4C.8:** Dorsal view of embryo of *H. xanthopus.*

**Fig. 4C.9:** Ventral view of embryo of *H. xanthopus.*

**Fig. 4C.10:** Photograph showing development of ‘Teat’ at the junction of appendix and diverticulum.

**Fig. 4C.11:** Photograph showing structure of ‘Teat’ after removal of membrane.

**Fig. 4C.12:** Photograph showing degenerating embryo of *H. xanthopus.*

**Fig. 4C.13:** Transverse section of ovariuterus of *H. xanthopus.*

**Fig. 4C.14:** L.S. of ovariuterus of *H. xanthopus* along with ova and Follicle.

**Fig. 4C.15:** L.S. of ovariuterus of *H. xanthopus* along with developing ova and follicle.

**Fig. 4C.16:** L.S. of ovariuterus of *H. xanthopus,* developing ova pushed outside the ovariuterus.

**Fig. 4C.17:** L.S. of ovariuterus of *H. xanthopus,* ovum is completely pushed outside the lumen of ovariuterus.

**Fig. 4C.18:** L.S. of ovariuterus showing formation of diverticulum with embryo.
Fig. 4C. 19: L.S. of ovariuterus showing the extended diverticulum.
Fig. 4C. 20: L.S. of ovariuterus and diverticulum of *H. xanthopus*, showing extended diverticulum with developing cells situated at the tip.
Fig. 4C. 21: L.S. of diverticulum and appendix of *H. xanthopus*, showing extended “Appendix”.
Fig. 4C. 22: L.S. of diverticulum of *H. xanthopus* showing the embryo with rounded structure of cephalic region/head.
Fig. 4C. 23: L.S. of diverticulum and appendix of *H. xanthopus* showing development ‘bottle and teat’.
Fig. 4C. 24: L.S. of middle portion of diverticulum of *H. xanthopus*.
Fig. 4C. 25: L.S. of diverticulum of *H. xanthopus* passing through UNKNOWN CELLULAR STRUCTURE.
Fig: 4C. 26: L.S. of knob like portion of diverticulum of *H. xanthopus*.
Fig: 4C. 27: L.S. of distal portion of diverticulum communicates to the embryo by Teat.
Fig: 4C. 28: L.S. of junction of diverticulum and appendix of *H. xanthopus*.
Fig: 4C.29: L.S. of tip of diverticulum showing, the teat passage extend towards the proximal portion of embryo.
Fig: 4C. 30: Lateral cut of diverticulum showing, an initial stage of organogenesis.
Fig: 4C. 31: Lateral cut of diverticulum showing, development of buds in later stage of organogenesis.
Fig: 4C. 32: L. S. of embryonic case observed after parturition.
Fig: 4C. 33: L. S. of accessory gland of female reproductive system of *H. xanthopus*.
Fig. 4D.1: Camera lucida diagrams of longitudinal sections of venom gland of *H. xanthopus*.
Fig. 4D. 2: T.S. of vesicle of *H. xanthopus*.
Fig. 4D. 3: L.S. of vesicle of *H. xanthopus*.
Fig. 4D. 4: T.S. of vesicular cuticle of *H. xanthopus*.
Fig. 4D. 5: T.S. of venom gland of *H. xanthopus*.
Fig. 4D. 6: Longitudinal section illustrating muscle-cuticle attachment in vesicle of *H. xanthopus*.
Fig. 4D. 7: T. S. of vesicle of *H. xanthopus*, showing the attachment of cuticle and venom gland.
Fig: 4D. 8: L.S. of venom gland of *H. xanthopus* (20x).
Fig: 4D. 9: L.S. of venom gland of *H. xanthopus* (40x).
Fig. 5A.1: Camera lucida diagram of anatomy of nervous system of *O. bicolor*.
**Fig. 5A.2:** Camera lucida diagrams of brain of *O. bicolor*.

**Fig. 5A.3:** Camera lucida diagrams of peripheral nerve innervations to chelicera, pedipalp, leg.

**Fig. 5A.4:** Camera lucida diagrams of peripheral nerve innervations to pectine and genital operculum.

**Fig. 5A.4C:** Camera lucida diagram of 4th and 5th metasoma of *O. bicolor*, showing nerve innervations at the posterior half of the fifth metasoma.

**Fig. 5A.5:** Lateral cut of cephalothoracic mass of *O. bicolor*.

**Fig. 5A.6:** T. S. passing through the protocerebrum of *O. bicolor*.

**Fig. 5A.7:** Sagital section of sub-oesophageal ganglion of *O. bicolor*.

**Fig. 5A.8:** L.S. of the first mesosomal ganglion of *O. bicolor*.

**Fig. 5A.9:** L.S. of the seventh ganglion of *O. bicolor*.

**Fig. 5A.10:** L.S. of the distal portion of seventh ganglion of *O. bicolor*.

**Fig. 5A.11:** L.S. of double ventral nerve cord of *O. bicolor*.

**Fig. 5B.1 (A & B):** Photograph and camera lucida diagram of male reproductive system of *O. bicolor*.

**Fig. 5B.2:** L.S. of testis of *O. bicolor*.

**Fig. 5B.3:** L.S. of testis of *O. bicolor*, showing arrangement of spermatogonia, spermatids and sperm packets.

**Fig. 5B.4:** Photograph of mature sperm of *O. bicolor*.

**Fig. 5B.5:** L. S. of cylindrical gland of *O. bicolor*.

**Fig. 5B.6:** L.S. of ventral annex gland of *O. bicolor*.

**Fig. 5B.7:** T.S. of Dorsal annex gland *O. bicolor*.

**Fig. 5B.8:** L.S. of vesicula seminalis *O. bicolor*.

**Fig. 5B.9A:** Photograph of paraxial organ *O. bicolor*.

**Fig. 5B.9: B-E:** L.S. of the ejaculatory sac of paraxial organ of *O. bicolor*.

**Fig. 5C.1(A & B):** Photograph and camera lucida diagram of female reproductive system of *O. bicolor* showing development of ovarian follicles in the months of June and July.

**Fig. 5C.2(A & B):** Photograph and camera lucida diagram of female reproductive system of *O. bicolor* showing development of ovarian follicles in last week of July to August.

**Fig. 5C.3(A & B):** Photograph and camera lucida diagram of female reproductive system of *O. bicolor* showing development of ovarian follicles in the months of September to October.
**Fig. 5C.4:** Camera lucida diagram of female reproductive system of *O. bicolor* showing development of ovarian follicles at the end of October to first two weeks of November.

**Fig. 5C. 5:** L.S. of ovariuterus of *O. bicolor*.

**Fig. 5C. 6:** L.S. of ovariuterus of *O. bicolor* showing developing ovum pushed outside.

**Fig. 5C. 7:** L.S. of ovariuterus of *O. bicolor* showing developing ovum appears as a small protuberance on the surface of the ovariuterus.

**Fig. 5C. 8:** L.S. of ovariuterus of *O. bicolor* along with developing follicle.

**Fig. 5C. 9:** Section passing through developing ovum of *O. bicolor*, showing first cleavage.

**Fig. 5C. 9:** Section passing through developing ovum of *O. bicolor*, showing second cleavage.

**Fig. 5C. 9:** Section passing through developing ovum of *O. bicolor*, showing third cleavage.

**Fig. 5C. 9:** Section passing through developing ovum of *O. bicolor*, showing subsequent cleavage.

**Fig. 5C. 13:** Section passing through developing follicle of *O. bicolor*, showing formation of blastoderm/germ disc.

**Fig. 5C. 14:** Section passing through developing follicle of *O. bicolor*, showing formation of epiblast and hypoblast.

**Fig. 5C. 15:** T.S. passing through developing embryo of *O. bicolor*, showing formation of three germ layers.

**Fig. 5C. 16:** Oblique section of follicle passing through developing embryo of *O. bicolor*.

**Fig. 5C. 17:** Section passing through developing follicle of *O. bicolor*, showing ten segmented elongated development of embryo.

**Fig. 5C. 18:** T.S. passing through the anterior segment of a ten-segmented embryo *O. bicolor*.

**Fig. 5C. 19:** Section passing through developing follicle of *O. bicolor*, showing eighteen segmented elongated embryo.

**Fig. 5D. 1:** L.S. of venom gland of *O. bicolor*.

**Fig. 5D.2:** T.S. of vesicle of *O. bicolor*.

**Fig. 5D.3:** T.S. of vesicle of *O. bicolor* showing foldings of venom gland.

**Fig. 5D.4:** L.S. of vesicle showing layers of cuticle and attachment of muscles to cuticle.