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THE CYSTICERCIDS IN LIZARDS (HEMIDACTYLUS TURCICUS *) AND THEIR TRANSMISSION TO A CAT

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Hemidactylus turcicus is a very common species in Çukurova, Turkey. They appear during the summer at night and are usually found around buildings. Some of them which are hunting flies are even seen near the lamp on the walls or ceilings of porches. We observe that these lizards are preferable prey to cats and think they might be the principle source of the tape worm infections of cats. Therefore we collected several lizards and dissected them to look for cysticercoids of the tapeworms.

In Turkey, the incidence of *Joyeuxia pasqualei* in cats was found to be very high (56.6 %) *Mimioğlu*, 1954.; but there is no available information about intermediate hosts of this parasite. According to *Witenberg* (1932) the life history of certain Dipylidiinae was studied by several authors and the summary of the results is presented by Lopez-Neyra. The author states also the complete life cycle is known only for *Dipylidium caninum*. The life histories of other Dipylidiinae, namely *Diplopylidium acanthotetra*, *Joyeuxia pasqualei*, and *Joyeuxia echinorhynchoides* are only partly elucidated. Their cysticercoid stages are found under the serous layers and in the connective tissue of lizards. *Parrot et al* (1920) studied the cysticercoids of *Tarentola moritanica* and gave an extensive summary of the works which were done before by several authors. They found cysticercoids on the outside of the wall of intestine of *Tarentola moritanica*. The cysticercoids were fed to baby cats to give rise to adult worms. The adult worms were found ripe on the third week after the infectious feed. The authors identified them as *Joyeuxia pasqualei* and *Diplopylidium acanthotetra*. *Oytun* (1961) in his textbook recorded that *Hemidactylus turcicus* was one of the intermediate hosts of

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Joyeuxia pasqualei. In Palestine, Israel the cysticercoïds of *Joyeuxia pasqualei* which are mostly of the polycercus type, were found by *Witenberg* (1928, 1932) in *Hemidactylus turcicus*, *Acanthodactylus syriacus*, *Trapeolus rudetratus*, *Stellio vulgaris*, *Zamenis carbonaria*, *Zamenis dahli* and *Ailurophis fallax*. He indicates that the secondary hosts recorded outside Palestine are *Lacerta viridis*, *Lacerta muralis*, *Varanus griceus* and *Crocidura suavevolens suavevolens*. The author was not able to produce infection by feeding the reptiles with gravid segment of the tape worms. He believes therefore the reptiles are secondary intermediate host while the primary ones are probably coprophagus insects. As a matter of fact this investigator tried to reproduce the development of the first stage of these worms in the house flies (*Musca domestica*). The larvae of the flies were reared on the rabbit feces to which gravid segments of *Joyeuxia pasqualei* were added. On consecutive days the larvae and hatched insects were carefully dissected, but no cestode larvae were found.

Material and Method

A total of twenty lizards (*Hemidactylus turcicus*) were collected in Çukurova State Farm. All of these were caught around the farm buildings and on the walls of porches. They were brought in to the laboratory and dissected to look for cysticercoïds. The cysticercoïds discovered from the lizards were examined under microscope and several pictures of these were drawn by camera lucida

Two baby cats, about six weeks of age that had begun to eat meat one week ago, were obtained; one of these was fed with seven infected lizards to give rise to adult worms, the other remained as a control. The feces of the cats were examined every other day to discover the eggs and gravid segments of the tape worms. The infected cat was treated with a vermifuge at the end of the experiment and the segments which were passed out in the feces were collected for identification.

Results

Of 20 lizards, 9 (45%) are found to carry cysticercoïds which are located under serous layers and in connective tissue of body cavities and the alimentary tract of the lizards (Figure 1). The cysticercoïds are white, almost round bodies, usually 0.6 - 1.3 mm. in diameter, and are located mostly under the serous layers. They are included in globular or elongated white cysts of different size up to 2 mm. in diameter. The number of the

Cysticeroids in lizards

cysts on the serous layers of the body cavities and alimentary tract of the lizards vary from 5 to 50. The number of contained cysticeroids (monocer-

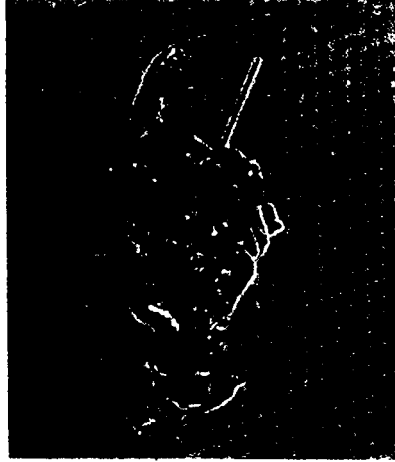


Figure 1. The cysticeroids in the lizard.

cus or polycercus type in each cyst also vary from 1 to 3 (Figures 2 and 3). The cysticeroids are not connected with the cyst wall and swim about in a transparent fluid. Each cysticeroid contains an elongated contractile body and a retractile or invaginable scolex provided with a fully developed

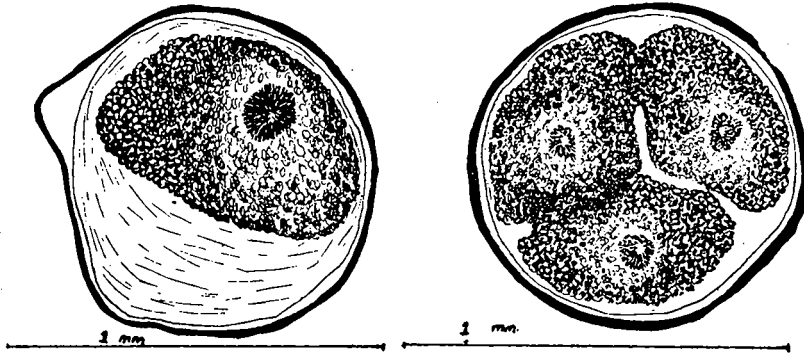


Figure 2. A. Cyst which contains a monocercus type of cysticeroid.

Figure 3. A Cyst which contains a polycercus type of cysticeroids.

rostellum and hooks (Figure 4). The body and scolex of the cysticercoids are packed with a dense mass of calcareous corpuscles (Figures 2 and 3).

The adult tape worms became ripe and the gravid segments began to pass out in the feces of the cat 11 weeks after the infectious feed. The cat was treated 4 weeks later and scolex of the parasite was looked for in the feces, but no scolex was found.

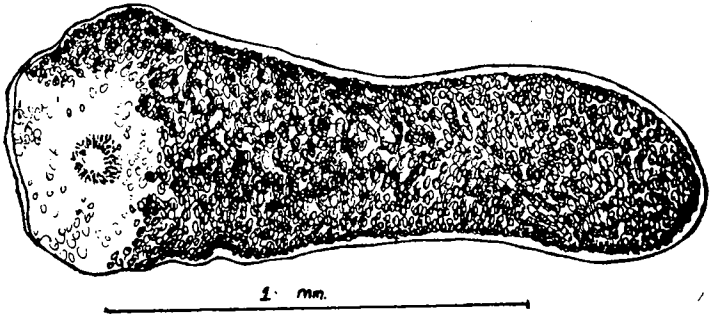


Figure 4. The cysticercoid which contains an elongated, contractile body.

The discharged gravid segments are rounded or oval, 1.3 to 5.9 mm. long and 1.5 to 2.1 mm. wide. The eggs fill the whole gravid segments medially and laterally to excretory vessels. The male opening in the segments is situated in front of the female opening (Figure 5).

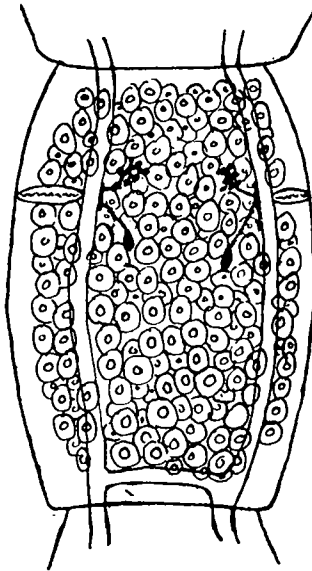


Figure 5. The gravid segment of *Joyeuxia pasqualei*.

The eggs are 31-47 microns in diameter while their outer membrane is 55.50 to 77.70 microns in diameter. Each egg has its own outer membrane. The eggs proper have a thin, transparent shell and are almost filled up with the oncosphere. They are separated from the outer membrane by an opaque, thick fluid (Figure 6)

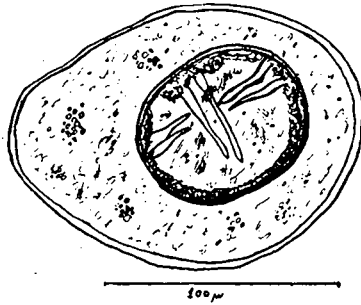


Figure 6. The egg of *Joyeuxia pasqualei*

Discussion and Conclusion

Witenberg (1932) indicates that the cysticercoids of *Diplopylidium acanthotetra*, *Joyeuxia pasqualei* and *Joyeuxia echinorhincoides* are found under the serous layers and in the connective tissue of lizards. He pointed out that in his experiments the cysticercoids of *Hemidactylus turcicus* gave



Figure 7. *Hemidactylus turcicus*.

rise to adults of *Joyeuxia pasqualei* when they were fed to cats. *Oytun* (1961) also recorded in his textbook that *Hemidactylus turcicus* is one of the intermediate host of *Joyeuxia pasqualei*. The cysticercoids which we discovered from *Hemidactylus turcicus* were also observed under the serous layers of the body cavities and alimentary tract. The cysticercoids which were discovered by *Witenberg* were mostly of polycercus type. The cysts from *Hemidactylus turcicus* in our study were found to contain cysticercoids which varied from 1 to 3. *Parot et al* (1920) stated that the cysticercoids of *Tarentole moritanica* developed into adults of *Joyeuxia pasqualei* 3 weeks after being fed to cats. We observed in our experiment the gravid segments of *Joyeuxia pasqualei* began to pass out in the feces 83 days after the cysticercoids of *Hemidactylus turcicus* were fed to a cat. According to *Witenberg* (1932) (·) The eggs of *Joyeuxia pasqualei* resemble those of *Joyeuxia echinorhincoides*, but are differently arranged. They fill the whole gravid segment, medially and laterally to excretory vessels, while those of the *Joyeuxia echinorhincoides* are packed between the excretory vessels. The author states also the eggs of *Joyeuxia pasqualei* are similar to those of the *Diplopylidium acanthotetra*, but the genital openings in the segments are differently situated. The male opening in *Joyeuxia pasqualei* is situated in front of the female one, whereas it is vice versa in *Diplopylidium acanthotetra*. In our specimens the gravid segments were filled with eggs medially and laterally to excretory vessels and the female opening is found behind the male opening. On the basis of these findings we arrived at the conclusion that the cysticercoids which were discovered from *Hemidactylus turcicus* in Çukurova are an intermediate stage of *Joyeuxia pasqualei*, and *Hemidactylus turcicus* should be an important source of infection of *Joyeuxia pasqualei* to cats.

S u m m a r y

Twenty lizards, *Hemidactylus turcicus*, were collected from Çukurova (Turkey). Nine out of these (45 %) were found to carry cysticercoids which were located under serous layers of body cavities and alimentary tracts. The cysticercoids were mostly polycercus type.

The cysticercoids were fed to a cat, six weeks of age to develop into adults; the gravid segments passed out in the feces 83 days after infectious feeding.

It is concluded that the cysticercoids are the intermediate stage of *Joyeuxia pasqualei* and *Hemidactylus turcicus* should be an important source of *Joyeuxia pasqualei* to cats.

Ö z e t

Çukurova'dan toplanan 20 kertenkele (*Hemidactylus turcicus*)'un diseksiyonu yapılarak parazitler aranmıştır. Bunlardan 9 (%45) tanesinin vücut boşluğu ve sindirim sistemi serozası altında *policercus* ve *monocercus* tabiatte cysticercoïd'lere rasrtlanmıştır. Erişkin paraziti elde etmek gayesiyle, bu cysticercoïd'ler, bir hafta önce süt'den kesilmiş, 6 haftalık bir kedi yavrusuna yedirilmiştir. 83 gün sonra kedinin gaitasında parazitin erişkin halkaları görülmüş ve *Joyeuxia pasqualei* olarak teşhis edilmiştir. Kardeş olan şahit kedide parazit görülmemiştir. *Hemidactylus turcicus*'un *Joyeuxia pasqualei* yönünden, memleketimiz kedileri için mühim bir enfeksiyon kaynağı olması ihtimali bulunduğu neticesine varılmıştır.

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