

**First description of the adult stages of *Postorchigenes* sp. (Trematoda: Lecithodendriidae) and *Malagashitrema* sp. (Trematoda: Homalometridae) infecting the common chameleon *Chamaeleo chamaeleon* (Reptilia: Chamaeleonidae) in Egypt**

Kareem Morsy<sup>1</sup>; Nadia Ramadan<sup>2</sup>; Salam Al Hashimi<sup>2</sup>; Medhat Ali<sup>2</sup>; Abdel-Rahman Bashtar<sup>1</sup>

<sup>1</sup> Zoology Department, Faculty of Science, Cairo University, Cairo, Egypt

<sup>2</sup> Zoology Departments, Faculty of Science, Ain Shams University, Cairo, Egypt

[Kareemsaid156@yahoo.com](mailto:Kareemsaid156@yahoo.com)

**Abstract:** In the present study, the morphological and morphometric characterization of two species of digenetic trematodes infecting the large intestines of the common chameleon *Chamaeleo chamaeleon* (Reptilia: Chamaeleonidae) were described by means of light microscopy as a first description. 30 and 37 out of 115 (26.1 % and 32.1%) of this lizard species were found to be naturally infected with *Postorchigenes* sp. (Trematoda: Lecithodendriidae) and *Malagashitrema* sp. (Trematoda: Homalometridae) respectively. *Postorchigenes* sp. possesses a body which is oval, spinulate with an oral sucker bigger than acetabulum. The prevalence of *Postorchigenes* sp. reported from the present study were agreed with the previous studies carried out by Kennedy *et al.* (1987) who described a three species of digenea from seven species of lizards in Indonesia. *Malagashitrema* sp. possesses oral sucker larger than acetabulum. The presence of *Malagashitrema* sp. proved that *Malagashitrema* is a genus with species linked to *Chamaeleo* spp. These trematodes adapted to different areas, making their presence are possible in different geographical regions in the world and appears to be a species adapted to *Chamaeleo* spp. [Kareem Morsy; Nadia Ramadan; Salam Al Hashimi; Medhat Ali; Abdel-Rahman Bashtar. **First description of the adult stages of *Postorchigenes* sp. (Trematoda: Lecithodendriidae) and *Malagashitrema* sp. (Trematoda: Homalometridae) infecting the common chameleon *Chamaeleo chamaeleon* (Reptilia: Chamaeleonidae) in Egypt.** *Life Sci J* 2012;9(4):400-405] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 60

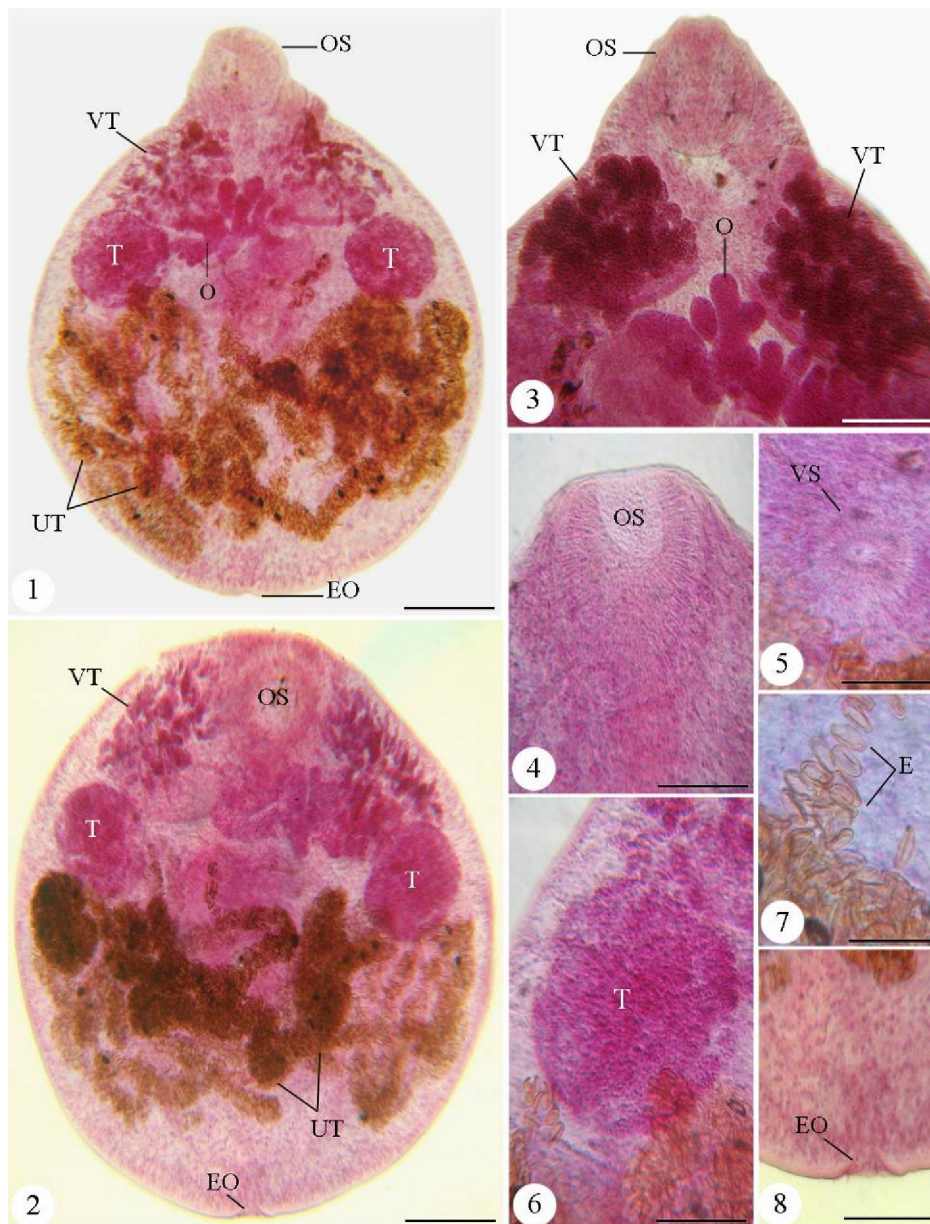
**Key words:** Digenea - *Postorchigenes* sp. - *Malagashitrema* sp. - *Chamaeleo chamaeleon* - Light microscopy.

## 1. Introduction

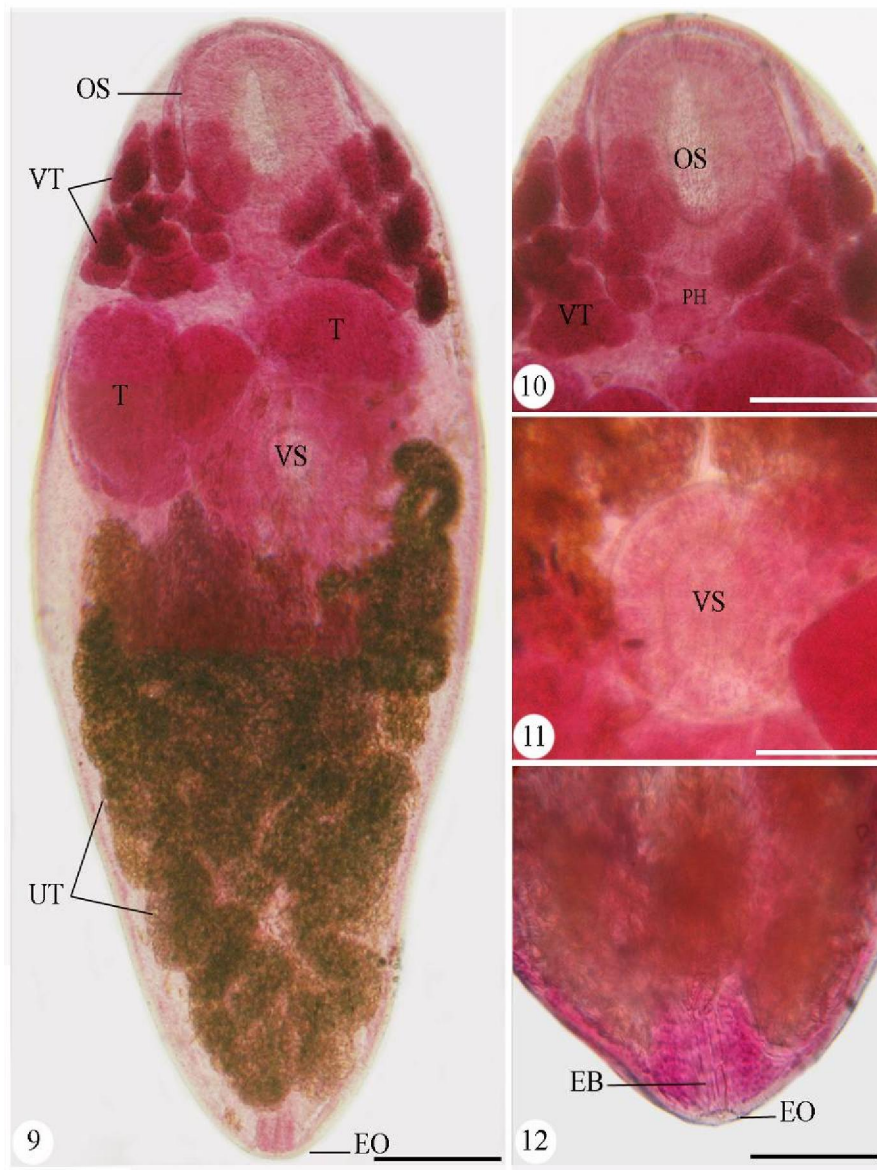
Chameleons (family Chamaeleonidae) are a distinctive and highly specialized clad of lizards. They are distinguished by their zygodactylous feet, their separately mobile and stereoscopic eyes, their very long, highly modified, and rapidly extrudable tongues, their swaying gait, the possession by many of a prehensile tail, crests on their distinctively shaped heads, and the ability of some to change color.

The original description of *Malagashitrema aphallosum* (Capron *et al.*, 1961) led to the creation of a new subfamily, Malagashitrematinae (Capron *et al.*, 1961) that the same authors incorporated in the family Allocreadiidae Stossich, 1903. Yamaguti (1971) placed the mentioned subfamily within Homalometridae (Cable et Hunninen, 1942), including parasites exclusive to chameleons, with a single genus *Malagashitrema* (Capron *et al.*, 1961). Up to the present, only two species of this genus have been described: the type species, *M. aphallosum* in *Chamaeleo* spp. (*C. verrucosus*, *C. oustaleti*, *C. lateralis*, *C. brevicornis*, *C. pardalis*) in Madagascar (Capron *et al.*, 1961 and Brygoo, 1963a) and *M. cameroonense* Fischthal, 1976 in African chameleons (*C. cristatus* and *C. africanus*) (Fischthal, 1976). The detection of *M. aphallosum* in *C. parsonii* Cuvier, 1825 represents a new

identification of this digenean species in a Malgache chameleon, furnishing new data about the morphometry of this parasite (Capron *et al.*, 1961). *Postorchigenes* is a genus of family Lecithodendriidae which includes digenetic trematodes with large acetabulum and vitelline glands extends laterally at the two sides of the body in the anterior region. Some *Postorchigenes* species were reported in 7 species of lizards in families Gekkonidae, Agamidae, Lacertidae and Scincidae from Indonesia (Kennedy *et al.*, 1987). There are 13 genera of lizard in Family Gekkonidae from Southeast Asia (Bellairs, 1969), among these, 7 species of 5 genera were reported in Thailand, *Cosymbotus platyurus*, *Gehyra* sp, *Gekko gecko*, *Hemidactylus frenatus*, *H. gamoti*, *Phyllodactylus melanostictus*, *P. siamensis* (Nabhitabhata J; Personal communication). Since no data are available for helminth parasites from Egyptian reptiles specially *Chamaeleo chamaeleon* so the present paper gives the first information about trematode parasites infecting this reptilian species by the determination of the prevalence, intensity and habitat of two digenetic trematodes in common chameleon *Chamaeleo chamaeleon* collected in South Sinai, Egypt. Also this study describes the worms recovered morphologically and morphometrically by means of light microscopy.

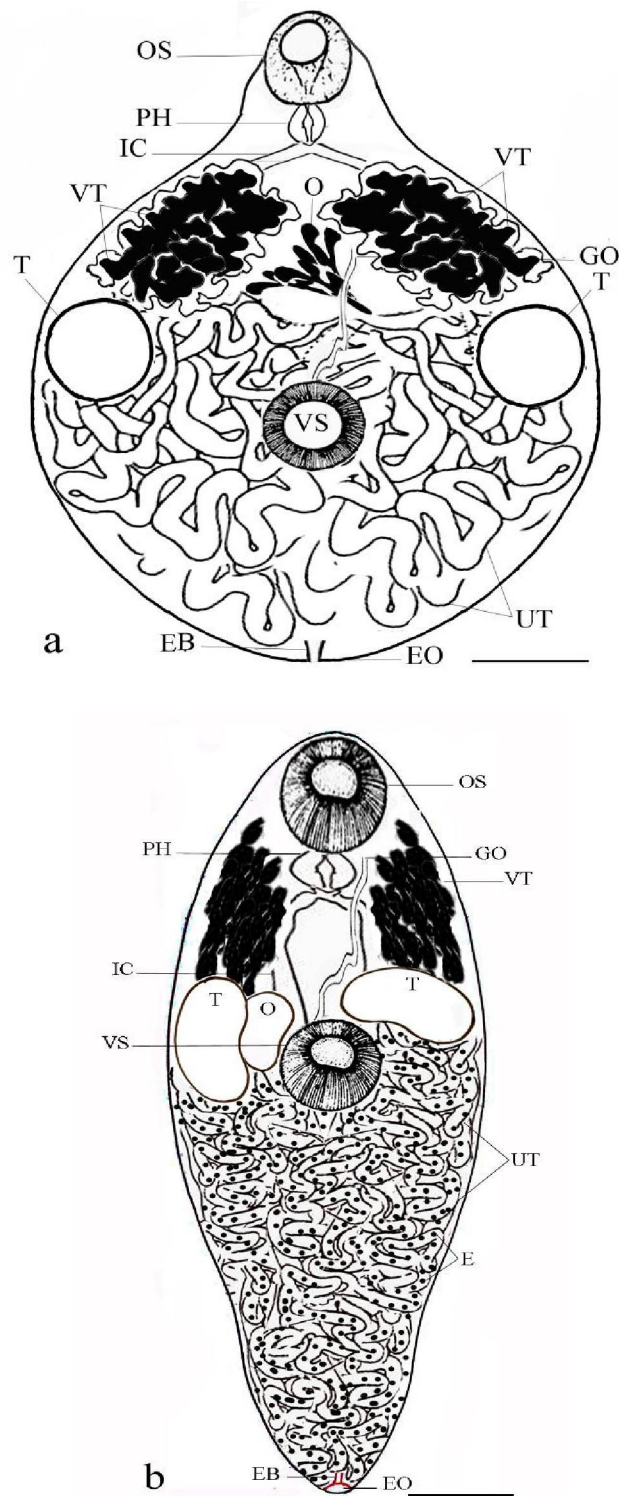


**Fig. 1-8:** Photomicrographs of the adult *Postorchigenes* sp. **1, 2** Whole mount preparations of the adult worm which is oval in shape terminated at the excretory opening (EO) and with a large anterior oral sucker (OS), median ventral sucker (VS), two oval testes (T) located laterally, a branched ovary (O) above the ventral sucker, lateral vitelline glands (VT), uterus (UT) which fill most of the posterior body region (Scale bar, 1mm). **3** High magnification of the anterior body showing the oral sucker (OS), a branched ovary (O), and the lateral vitelline glands (VT). (Scale bar, 0.4mm) **4-8** High magnifications of: **4** oral sucker (OS) (Scale bar, 0.3mm), **5** ventral sucker (VS) (Scale bar, 0.3mm), **6** Testis (T) (Scale bar, 0.4mm), **7** Eggs (E) (Scale bar, 0.4mm), **8** Excretory opening (EO) (Scale bar, 0.4mm).



**Fig. 9-12:** Photomicrographs of the adult *Malagashitrema* sp. **9** Whole mount preparations of the adult worm which terminated at the excretory opening (EO) with an anterior oral sucker (OS) nearly equal in size with a ventral sucker (VS) situated at the anterior third of the body, two ellipsoidal testes (T) enclosing ovary (O) in between, lateral vitelline glands (VT), uterus (UT) which fill most of the posterior body region (Scale bar, 0.3mm) **10-12** High magnifications (Scale bar, 0.2mm) of : **10** Anterior body showing oral sucker (OS), Pharynx (PH) and the lateral vitelline glands (VT). **11** ventral sucker (VS), **12** Excretory canal (EB) terminated at the excretory opening (EO).





**Fig.13:** Line diagram of the adult worms of: **a** *Postorchigenes* sp. (Scale bar, 1mm). **b** *Malagashitrema* sp. (Scale bar, 0.3mm). Oral sucker (OS), ventral sucker (VS), pharynx (PH), intestinal caeca (IC), testis (T), ovary (OV), uterus (UT), vitelline follicles (VT), excretory bladder (EB), excretory (EO) and genital openings (GO).

## 2. Material and Methods

Lizards were collected by hand or noose from south Sinai, Egypt during the period of 2011. Each lizard was killed within 8-24 hrs after capture with an intraperitoneal injection of a dilute solution of sodium pentobarbital or exposure to chloroform and fixed in 10% formalin and then stored in 70% ethanol. The flukes collected from the stomach and intestines were washed out with normal saline (0.7% NaCl). The worm washing processes are repeated several times to remove any mucus or debris from their surface, then flukes were fixed in 5% formalin, flattened by repression and stained in acetic acid Carmine for 45 min, washed in tap water, dehydrated through a graduated series of alcohol (50 %, 70 %, 90 %, 100 %), cleared in xylene, mounted in Canada Balsam, and examined under the microscope. Taxonomic identifications of the digenean worms were based on Yamaguti (1971). Illustrations of the presented new species were made through the aid of a drawing tube.

## 3. Results

Thirty out of 115 (26.1%) of the common chameleon *Chamaeleo chamaeleon* (Reptilia: Chamaeleonidae) were found to be naturally infected with the digenetic trematode *Postorchigenes* sp. belonging to family Lecithodendriidae and 37 out of 115 (32.1%) of the same lizard species were found to be naturally infected with *Malagashitrema* sp. (Trematoda: Homalometridae). The two species of digenetic trematodes were described for the first time in Egypt from this host species.

### *Postorchigenes* sp.

#### Taxonomic summary

Type-host: *Chamaeleo chamaeleon* (Family: Chamaeleonidae).

Site of infection: infecting the intestine of the host lizard.

Type-locality: South Sinai, Egypt.

Prevalence: 290 lizard samples were examined for digenean parasites, 30 (74.1%) fish were infected.

Materials deposited: Slides were deposited at Zoology Department museum, Zoology Department, Faculty of Science, Ain Shams University, Egypt.

**Description:** Body oval, spinulate 0.8 - 1.7 (1.3±0.2) mm long by 0.60 - 1.40 (1.0±0.2) mm wide (10 specimens). Oral sucker larger than acetabulum 0.13- 0.18 (0.15±0.02) mm in diameter. Acetabulum small, pre-equatorial 0.08-0.12 (0.09±0.02) mm in diameter. Prepharynx absent, esophagus short, ceca extending posterior to testes 0.08 - 1.4 (1.1±0.2) long by 0.14-0.19 (0.15±0.02) mm wide. Testes oval, nearly symmetrical, post-acetabulum, in middle level of the body 0.17-0.22 (0.20±0.02) mm in diameter. Cirrus pouch on left side of acetabulum 0.29-0.35 (3.1±0.2) mm long by 0.10-0.16 (0.12±0.02) mm wide. Genital pore posterolateral to acetabulum.

Ovary on right side of acetabulum, branched 0.25-0.32 (0.26±0.02) mm long by 0.20-0.25 (0.21±0.02) mm wide. Vitelline glands extending transversely across the entire body between pharynx and acetabulum. Uterus occupying hind body and bifurcation. Excretory vesicle V-shaped.

### *Malagashitrema* sp.

#### Taxonomic summary

Type-host: *Chamaeleo chamaeleon* (Family: Chamaeleonidae).

Site of infection: infecting the intestine of the host lizard.

Type-locality: South Sinai, Egypt.

Prevalence: 290 lizard samples were examined for digenean parasites, 37 (74.1%) were infected.

Materials deposited: Slides were deposited at Zoology Department museum, Zoology Department, Faculty of Science, Ain Shams University, Egypt.

**Description:** Body large, smooth, 2.2- 3.7 (2.4±0.2) mm long by 0.90 -1.30 (1.1±0.2) mm wide (10 specimens). Oral sucker larger than acetabulum, 0.35-0.42 (0.39±0.02) mm in diameter. Prepharynx absent, esophagus short, ceca wide straight, terminating near posterior extremity, 1.62-2.12 (1.9±0.2) mm long by 0.22-0.30 (0.27±0.02) mm wide. Acetabulum in anterior half of body. Testes slightly lobed, symmetrical, partly in acetabulum zone, 0.38-0.45 (0.42±0.02) mm in diameter. Cirrus pouch pre-acetabulum 0.39-0.50 (0.41±0.02) mm long by 0.10-0.15 (0.13±0.02) mm wide. Ovary in between lobes of testes 0.22-0.30 (0.23±0.02) mm in diameter. Vitelline follicles numerous, in extracecal fields, in anterior third of the body. Uterus occupying posttesticular region. Excretory bladder tubular.

## 4. Discussion

Thirty (26.1%) and thirty seven (32.1%) of 115 *Chamaeleo chamaeleon* harbored two new helminthes representing 2 species, these are *Postorchigenes* sp. belonging to family Lecithodendriidae, and *Malagashitrema* sp. of family Homalometridae. Many studies were carried out to determine the prevalence of digenetic trematodes and helminth parasites in different lizard hosts (Yamaguti, 1958; Al-Barwari and Nassir 1983; Kennedy *et al.*, 1987; Goldberg *et al.*, 1993; 1994; Didyk *et al.*, 2007; Yildirimhan *et al.*, 2011). The prevalence of *Postorchigenes* sp. (26.1%) reported from the present study were agreed with the previous study carried out by Kennedy *et al.* (1987) who described a three species of digenetic trematodes from seven species of lizards from Indonesia. Also they found that prevalence and intensity of *P. geckonum* and *P. ovatus* were similar in males and females of each host species examined except for the gecko *Gehyra mutilata*, in which females had a significantly higher prevalence of infection of both parasites than

males and this difference is possibly due to differential food preference.

The presence of *Malagashitrema* spp. proved that *Malagashitrema* is a genus with species linked to *Chamaeleo* spp. These trematodes adapted to different areas, making their presence are possible in different geographical regions in the world and appears to be a species adapted to *Chamaeleo* spp. (Casanova *et al.*, 1994). In the 298 specimens of the ten chameleon species analyzed by Capron *et al.* (1961), *M. aphallosum* was detected with a general prevalence of a 2,340% 1,340% in *Chamaeleo oustaleti*, 0.670% in *Chamaeleo lateralis* and 0,330% in *Chamaeleo verrucosus*.

In the only specimen of *C. parsonii* analyzed by the above-mentioned authors, as well as those species of chameleons from which only a few specimens were analysed (1 of *Chamaeleo minor*, *C. rhinoceratus* and *C. boettgeri*; 2 of *C. guentheri* and *Chamaeleo* sp.; 25 of *C. pardalis*), *M. aphallosum* was not detected. In a larger sample (627 chameleons), Brygoo (1963a) detected the digenean in 3,820% of the hosts, amplifying the host range with two new species, *C. pardalis* and *C. brevicornis*, with a prevalence of 7,01 % and 4,00% respectively. The absence of this parasite in *C. parsonii* in Brygoo's study (1963a) could be due to the low number of individuals of this species analyzed (n=8). The presence of *Malagashitrema* in most of the examined *Chamaeleo* lizards by previous studies in addition to our identification supports the hypothesis formulated by Brygoo (1963b) referring to the endemic character of this trematode species in *Chamaeleo* spp.

#### Corresponding author

Kareem Said Morsy  
Zoology Department, Faculty of Science, Cairo  
University, Cairo, Egypt  
[Kareemsaid156@yahoo.com](mailto:Kareemsaid156@yahoo.com)

#### References

1. Al-Barwari, SE and Nassir JK (1983). First record of ten species of helminthic parasites from vertebrates in Iraq. Iraqi Journal of Science; 24: 101-108.
2. Bellairs A (1969). Classification of living reptiles. London: Weidenfeld and Nicolson.
3. Brygoo ER (1963a). Contribution it la connaissance de la Parasitologie des cameleons malgaches (Iere partie). Annales de Parasitologie Humaine et Comparee; 38: 149-334.
4. Brygoo ER (1963b). Contribution it la connaissance de la Parasitologie des carneleons malgaches (Zerne partie). Annales de Parasitologie Humaine et Comparee; 38: 520-739.
5. Cable RM and Hunninen AV (1942). Studies on *Deropristis inflata* (Molin), its life history and affinities to trematodes of the family Acanthocolpidae. Biological Bulletin; 82:292-312.
6. Capron, A.; Deblock, S., Brygoo, E.R. (1961): Trematodes de carneleons de Madagascar. Archives de l'Instiuv Pasteur de Madagascar; 30 (1): 1-71.
7. Casanova JC, Feliui C, Gomezi MS, Fernandez J, Ensenat,C (1994): *Chamaeleo parsonii* Cuvier, 1825 (Reptilia: Chamaeleonidae) From Madagascar, a new host for *Malagashitrema aphallosum* Capron, Deblock et Brygoo, 1961 (Trematoda: Homalometridae). Research and Reviews in Parasitology; 54 (4): 213-215.
8. Didyk AS, Canaris AG, Kinsella JM (2007). Intestinal helminths of the spotted sandpiper, *Actitis macularius* (L.), during fall migration in New Brunswick, Canada, with a checklist of helminths reported from this host. Comparative Parasitology; 74: 359-363.
9. Fischthal JH (1976). Some digenetic trematodes of lizards from Cameroon, Togo and Zaire, Revue de Zoologie Africaine; 90: 640-648.
10. Goldberg SR, Bursey CR, Tawil R (1993). Gastrointestinal helminths of five homed lizard species, *Phrynosoma* (Phrynosomidae) from Arizona. Journal of Helminthological Society of Washington; 60: 234-238.
11. Goldberg SR, Bursey CR, Tawil R (1994). Gastrointestinal helminths of *sceloporus* lizards (Phrynosomatidae) from Arizona. Journal of Helminthological Society of Washington; 61:73-83.
12. Kennedy MJ, Killick LM, Beverley-Burton M (1987). The prevalenceof *Paradistomum geckonum*, *Mesocoelium sociale* and *Postorchigenes ovatus* (Digenea) in lizards (*Sauria*) from Indonesia. Canadian Journal of Zoology; 65: 1292-1294.
13. Yamaguti S (1958). Systema helminthum. Vol I. The digenetic trematodes of vertebrates. Part I and 11. New York: Interscience Publishers; 1575 pp.
14. Yamaguti S (1971). Synopsis of digenetic trematodes of vertebrates. Vols. 1 and 2. Keigaku Publishing Co., Tokyo.
15. Yildirimhani HS, Bursey RC, Naci Altunel F (2011). Helminth parasites of the Balkan green lizard, *Lacerta trilineata* Bedriaga 1886, from Bursa, Turkey. Turkey Journal of Zoology; 35(3):1-17.

9/3/2012