

Small Indian mongoose *Herpestes auropunctatus* (Hodgson, 1836) on the Adriatic Islands of Yugoslavia

Nikola Tvrtković & Boris Krystufek

Abstract. Seven mongooses from three Adriatic islands of Yugoslavia were examined. They were shown to belong to *Herpestes auropunctatus*. The history of their introduction since 1910, present distribution and biological remarks are given. The Adriatic population of *H. auropunctatus* is the only one of its kind in Europe.

Key words. Mammalia, Viverridae, *Herpestes auropunctatus*, Yugoslavia, identity, distribution, status.

Introduction

Two species of mongooses, genus *Herpestes*, are reported for Europe in the current literature. *H. ichneumon* is a native of Spain and Portugal (Miller 1912; Niethammer 1963; Corbet 1978) while *H. edwardsi* was introduced to Italy around 1960 (Toschi 1965; Corbet & Ovenden 1980). The identity of mongooses introduced to Dalmatia at the beginning of the century remains unclear. They are found under different names in the literature: *Mungos mungo* (Anonymous 1927, 1959; Fink 1960), *Mungo mungo* (Dubac 1961; Maričić-Brusina 1964), and *Herpestes mungo* or *H. griseus* (Hirtz 1927a, 1927b). In the more recent mammalogical papers they are reported as *H. ichneumon* (Van den Brink 1957; Niethammer 1963; Mirić 1970; Corbet 1978; Corbet & Ovenden 1980; Osborn & Helmy 1980; Görner & Hacketal 1987) or *H. edwardsi* (Djulić and Tortić 1960 — with a question mark; Toschi 1965; Van den Brink 1972). Only Tvrtković (1982) ascribed them to *H. auropunctatus*. The aim of the present article is to clarify the identity of mongooses introduced to Adriatic islands and briefly elaborate the history of introduction and actual distribution.

Material and Methods

We examined 7 mongooses from three Adriatic islands. The material is stored in the Croatian Natural History Museum (HPM) and Natural History Museum of Slovenia (PMS). Comparative material of *Herpestes auropunctatus*, *H. edwardsi*, *H. sanguineus*, *H. javanicus*, and *H. pulverulentulus* was examined in the Naturhistorisches Museum Wien (NMW). Skull measurements published by Harrison (1968) and Osborn & Helmy (1980) were used for comparison.

External measurements were recorded from the specimen labels. Cranial measurements were taken by a dial caliper to the nearest 0.1 mm. The definitions and symbols of the measurements were as follows: HB — head and body length; TL — tail length; HF — hind foot length; E — ear length; CB — condylobasal length; ZB — zygomatic breadth; IC — interorbital constriction; BB — braincase breadth; ML — mandible length; MTR — maxillary tooth row length. Measurements are given in mm.

Specimens examined: Yugoslavia: HPM 1081, 1 ♂, Mljet Is., July 1959; HPM 1602, 1 sex?, Mljet Is., June 1950; HPM 1603, 1 ♀, Mljet Is., 1959; HPM 1784, 1 ♂, Lumbarda, Korčula Is., January 1, 1985; HPM 1785, 1 ♀, Lumbarda, Korčula Is., January 11, 1985; HPM 1786, 1 ♀, Hvar Is., March 4, 1988; PMS 5437, 1 ♂, Blato, Korčula Is., April 12, 1987.

Comparative material of *H. auropunctatus*: NMW B 2204, 1 juv., Islamabad, Kashmir, India, 1867; NMW 22171, 1 ♂, Baghdad, Iraq, August 1910; NMW 1173, 1886, B 5197, 3 ♂, no locality (Tiergarten Schönbrunn, Wien), from 1897 to 1939.

Results and Discussion

Identity of mongooses from the Adriatic Islands

The examined mongooses from the islands of Mljet, Korčula and Hvar belong to a smaller species of the genus *Herpestes*. The colour and shape of the tail, the dimensions and shape of the skull, bullae tympani in particular (Fig. 1), revealed no similarity either to *H. ichneumon* or *H. edwardsi*. On the basis of the dimensions (Table 1) our material appeared identical with the NMW specimens of *H. auropunctatus*. In addition, our specimens could not be identified with any of the 14 species of the genus *Herpestes* listed by Corbet & Hill (1980) except with *auropunctatus*. This is in accordance with recently discovered data in an official account (only an official copy is preserved) in the Archives of Croatia, Zagreb. According to this Z. Levičnik from Zadar on October 19th, 1913 reported an introduction of "*Cherpes(s)es palli(du)s*", now (Corbet 1978) *Herpestes auropunctatus pallipes* (Blyth 1845), i. e. a species otherwise distributed in Afghanistan and western India.

Table 1: External and skull measurements in mm of *Herpestes auropunctatus* in Yugoslavia compared to specimens from NMW and Harrison (1968). See text for abbreviations.

		HB	TL	HF	E	CB	ZB	IC	BB	ML	MTR	
HPM 1081	Mljet Is., Yugoslavia	♂	—	—	—	61.7	31.6	10.7	24.3	37.0	22.0	
HPM 1602	Mljet Is., Yugoslavia	—	—	—	—	58.9	28.2	9.9	22.7	—	—	
HPM 1603	Mljet Is., Yugoslavia	♀	390	210	48	20	—	—	—	—	—	
HPM 1784	Korčula Is., Yugoslavia	♂	291	261	48	26	63.1	31.6	10.7	23.9	40.6	22.6
HPM 1785	Korčula Is., Yugoslavia	♀	272	241	45	24	—	30.1	10.6	—	39.2	21.6
HPM 1786	Hvar Is., Yugoslavia	♀	287	234	45	23	59.0	28.6	10.0	21.5	38.4	22.1
PMS 5437	Korčula Is., Yugoslavia	♂	315	250	51	21.4	62.2	32.8	11.4	24.4	40.1	22.0
NMW B2204	Islamabad, Pakistan	—	—	—	—	—	—	11.2	—	38.4	22.2	
NMW 21171	Bagdad, Iraq	♂	260	220	47	21	58.2	27.1	10.2	22.3	37.5	22.2
NMW 1173	no exact locality	♂	—	—	—	—	62.9	31.4	11.5	22.1	42.0	22.1
NMW 1886	no exact locality	—	—	—	—	—	60.7	—	—	—	39.7	22.4
NMW B5197	no exact locality	♂	320	240	56	17	64.9	33.7	12.4	23.6	44.2	23.3
Harrison 1968	Iraq	—	298	247	51.6	24.3	60.8	29.6	10.4	21.8	38.4	22.2
Harrison 1968	Iraq	—	274	237.5	49.3	23.7	58.8	28.3	10.5	22.2	37.5	21.8
Harrison 1968	Iraq	—	283.5	227.1	45.6	25.2	58.6	28.8	10	20.9	36	21.3
Harrison 1968	Iraq	—	269	221	43.7	23	55.5	27.5	9.8	20.3	34.2	20.8
Harrison 1968	Iraq	—	245	220	45.8	19.8	—	—	—	—	—	—
Harrison 1968	Iraq	—	—	—	—	—	54.8	25.9	11.8	20.5	34	20.3
Harrison 1968	no exact locality	—	—	—	—	—	60.6	31	11.2	21.8	38.2	22.2
Harrison 1968	no exact locality	—	—	—	—	—	—	—	—	—	38.7	22.2

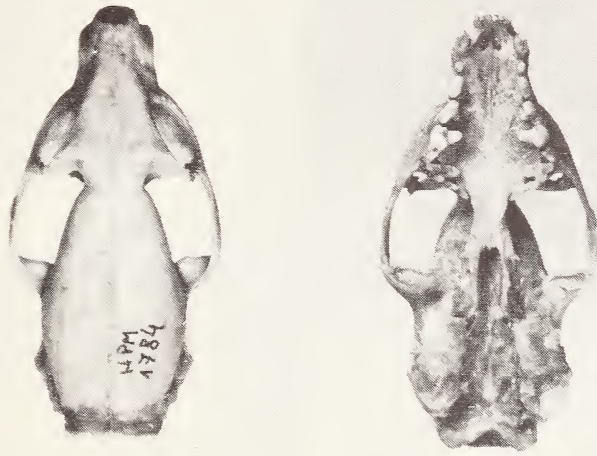


Fig. 1: Skull of *Herpestes auropunctatus* (adult male) from Korčula island, Yugoslavia.

History of introduction and biological remarks

Due to a large number of horned vipers (*Vipera ammodytes*) populating the Island of Mljet it was known as the "island of snakes" at the beginning of the century. To exterminate the said venomous snakes, the Austro-Hungarian Imperial and Royal Ministry of Agriculture purchased 12 mongooses in 1910. The first approximate data on the introduction were published by Baničević (1926, 1927), a parish priest from Korčula Is. The mongooses were discussed at the same time in a popular Croatian magazine "Priroda" by Tiozzo (1927) and Petković (1927); their data, however, differ from those of Baničević (1927). Thus, until a recent search through the official files of the Austro-Hungarian authorities kept in the Archives of Croatia at Zagreb referring to the period between 1910 and 1916, no reliable details were known as to the origin of mongooses, the number of specimens introduced, and time when they were first brought to Mljet Is. The examined official papers include a pedantic report on the transportation of the animals to the islands, their food and health condition, as well as observations of the animals on their release and measures taken to ensure an undisturbed growth of the population.

The mongooses purchased in India were shipped to Trieste and then transported to the town of Korčula (Korčula Is.) on July 13th, 1910. They were taken over by Karl Najedly, a senior forestry inspector, who was made personally responsible for their introduction. After a period of quarantine and acclimatization during which they were under constant veterinary control, 11 specimens, 7 males and 4 females, were released at the source of the stream Vodice (Babino polje — Sobra), Mljet Is. (point 1 in Fig. 2), on August 26th, 1910. On August 31st, 1910 a specimen was

already noticed in the locality Soline, Govedjari (point 2), 17 km away from the place of release. In September 1911 a female and her young were seen at Porto Poma (point 3). Unfortunately, World War I put an end to further observations.

On Mljet Is. the small Indian mongoose multiplied quite quickly while justifying its reputation as the best snake killer of its genus (Niethammer 1963). Nowadays, snakes are very rare on Mljet Is. (personal observation) even though Mljet and the neighbouring islands are known for 10 snake and 6 lizard species. Since World War II the horned viper is no longer known on Mljet Is., whereas it still lives on the islands where the mongoose was introduced later. A rapid decrease in the number of snakes and large numbers of mongooses on Mljet Is. after 1920 led to a gradual depopulation of mongooses and their planned introduction onto other islands and the mainland.

Between 1921 and 1927 mongooses were repeatedly introduced onto the Peninsula of Pelješac, namely to the vicinity of Trpanj (point 4 in Fig. 2), Orebić (point 5) and Janjina (point 6; Anonymous 1927; Baničević 1927; Petković 1927; Joković 1927). On Korčula Is. they were introduced in the vicinity of the towns of Korčula (point 7) and Vela Luka (point 8; Joković 1927). Mongooses were brought to Brač Is. about 1926; in 1929 they were observed at Bol (point 9). In 1936 a specimen was caught at Sutivan (point 10; Tresić-Pavičić 1936). Later on attempts seem to have been made to introduce mongooses also onto the other Adriatic islands and the continent, but their introduction was prevented on the Brioni Islands in the northern Adriatic Sea (A. Sabadi, personal communication). The animals released in the vicinity of Mostar, Herzegovina (point 11) soon perished according to oral statements of local hunters. They were also introduced on Golem Grad, an isle of less than 1 km², situated in Prespansko ezero (a lake in Macedonia not shown in Fig. 1). The origin of these specimens and their later fate, however, was unknown (S. Petkovski, personal communication). Tiozzo (1927) observed that cooler winters with temperatures below -2° increase the mortality of mongooses. In small stock populations this probably represents a limiting factor of their survival and distribution on the continent. The population on Mljet Is. itself reveals considerable fluctuations. Thus, for instance, around the year 1961 Kumerloev could not state whether mongooses lived on Mljet Is. at all (Niethammer 1963).

Up to 1936 the mongooses must have lived on the Peninsula of Pelješac and the islands of Mljet, Korčula, and Brač. No recent data on their presence is available on Brač while they are frequent on Mljet Is. (personal observations), Korčula Is. (F. Kršinić, personal communication) and the Peninsula of Pelješac (M. Miljanić, personal communication). About 1970 the mongoose was introduced onto Hvar Is. where it is now quite frequent (B. Borčić, personal communication).

On the islands the mongoose is harmful to the wild fowl so that hunting organizations endeavour, rather unsuccessfully, to exterminate it. The damage caused by the mongoose to vegetables, figs, grapes, and poultry as well as to the wild fowl has been reported by different authors (Anonymous 1927; Leontić 1928; Vuković 1949) and natives (personal communications). According to Tresić-Pavičić (1936), J. Mateljan, a merchant from Sumartin, Brač Is., sold about 100 mongooses from Mljet Is. to Venezuela around 1926. Thus, a part of the present American population of *H. auropunctatus*, populating the Caribbean Islands and northeastern South America

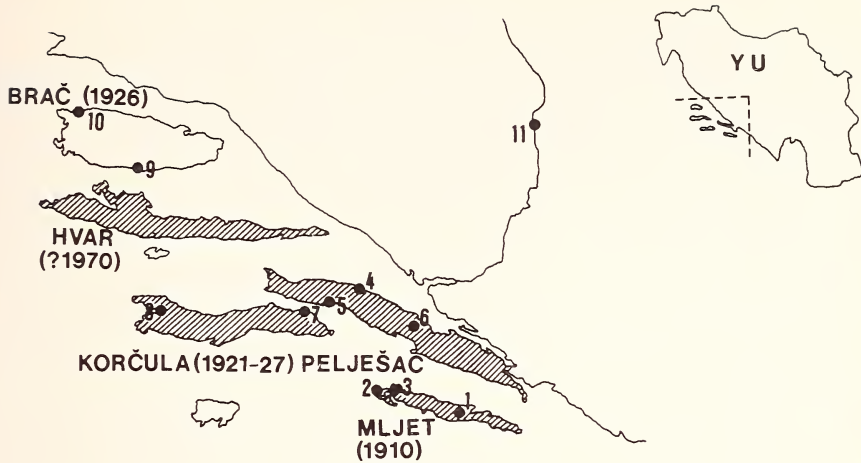


Fig. 2: Present distribution (hatched) of *Herpestes auropunctatus* in Yugoslavia. The year of introduction is given in brackets for each region. See text for identifying numbers of localities.

probably descends from the specimens from Mljet Is. The population of *H. auropunctatus* of Dalmatia is now the only one of its kind in Europe.

The Adriatic islands onto which the mongoose has been introduced are populated by the following mammals: *Erinaceus concolor*, *Crocidura suaveolens*, *Rattus rattus frugivorus*, *Apodemus mystacinus* (Mljet, Korčula), *Apodemus sylvaticus* (Korčula, Brač, Hvar), *Mus domesticus*, *Eliomys quercinus* (Hvar), *Glis glis* (Djulić & Tvrtković 1979; Kryštufek & Tvrtković 1988), *Canis aureus* (Korčula; Kryštufek & Tvrtković, in press), and *Martes foina*.

On the island of Mljet, remnants of mongoose were found in the pellets of the eagle owl (*Bubo bubo*). Since this owl is quite common on the Adriatic islands we can expect it to be an important predator of the small Indian mongoose.

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Zusammenfassung

Sieben Ichneumons von drei Inseln in der Adria wurden untersucht. Alle gehören der Art *Herpestes auropunctatus* an. Die Geschichte ihres Ansiedelns vom Jahre 1910 an, die jetzige Ausbreitung und die Wahrnehmungen über ihre Biologie werden behandelt. Die auf den adriatischen Inseln lebende Population von *H. auropunctatus* ist die einzige dieser Art in Europa.

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