NATURA - Soc.ital.Sci.nat., Museo civ.Stor.nat. e Acquario civ., Milano - 68 (3-4): 157-165, 15-XII-1977

BENEDETTO LANZA & ROSSANA BRIZZI (*)

THE LIZARD OF PIANA DI CAVALLO ISLAND (SOUTHEASTERN CORSICA): *PODARCIS MURALIS CONTII* SUBSP. NOVA

(*Reptilia Lacertidae*) (**)

Abstract. — Description of *Podarcis muralis contii* subsp. nova from Piana di Cavallo Island (southeastern Corsica); the new *tiliguerta*-like race is characterized by the presence of numerous light coloured phenotypes (about 40%) with a more or less strongly reduced dorsal pattern. The basement of Piana di Cavallo Island is rocky and stands barely above sea level, rising out of a sandy shoal. For this reason sandy deposits have progressively covered the rocky part, which today is practically hidden under a thick layer of sand, a situation probably dating back a few thousand years. The *Podarcis muralis* population inhabiting the primitive rocky island has thus gradually been forced to live on a substrate completely different from that to which the species is generally bound due to its ecological requirements. It is possible that natural selection favoured, through reduction of predation, the mutants blending with the sandy substrate.

Riassunto. — *La lucertola dell'Isola Piana di Cavallo (Corsica sud-orientale):* Podarcis muralis contii *subsp. nova* (Reptilia Lacertidae).

Descrizione della *Podarcis muralis contii* subsp. nova, endemica dell' Isola Piana di Cavallo; la nuova razza, simile alla *tiliguerta,* è caratterizzata dalla presenza di numerosi fenotipi (circa il 40%) di color chiaro e con disegno dorsale più o meno fortemente ridotto. Il basamento dell' Isola Piana di Cavallo è roccioso ed emerge di poco da un bassofondo sabbioso; depositi di sabbia l'hanno progressivamente ricoperto, tanto che oggi l' isola è quasi del tutto nascosta sotto di essi, una situazione che probabilmente risale ad alcune migliaia di anni fa. La popolazione di *Podarcis muralis* che abitava la primitiva isola rocciosa si adattò perciò gradualmente a vivere su un substrato completamente diverso da quello a cui la specie è generalmente legata dalle sue richieste ecologiche. E' possibile che la selezione naturale, tramite la riduzione della predazione, abbia favorito i mutanti che armonizzavano col substrato sabbioso.

(*) « Istituto di Anatomia Comparata, Biologia Generale e Genetica » e « Museo Zoologico » dell'Università, Via Romana 17, 50125 Firenze.

(**) This research was supported by the Ministero della Pubblica Istruzione.

During our naturalistic research on the satellite Corsican islands, islets and roks, begun in 1971, we had always given little importance to the relatively large (6½ hectares) and seemingly young Piana di Cavallo Island. In fact, owing to these characteristics, there seemed to be little chance that endemic forms, particularly of lizards, could have arisen on it. Thus, in April 1973, we were surprised to find that the island was inhabited by a very peculiar population of *Podarcis muralis* that we consider worthy of describing as

Podarcis muralis contii subsp. nova.

Holotype: ad. ♂ n. 18913 M.F. (= Museo Zoologico of the University of Florence), Benedetto and Marco Lanza, Fabio Sammicheli and Riccardo Simoni leg. 12.VIII.1973.

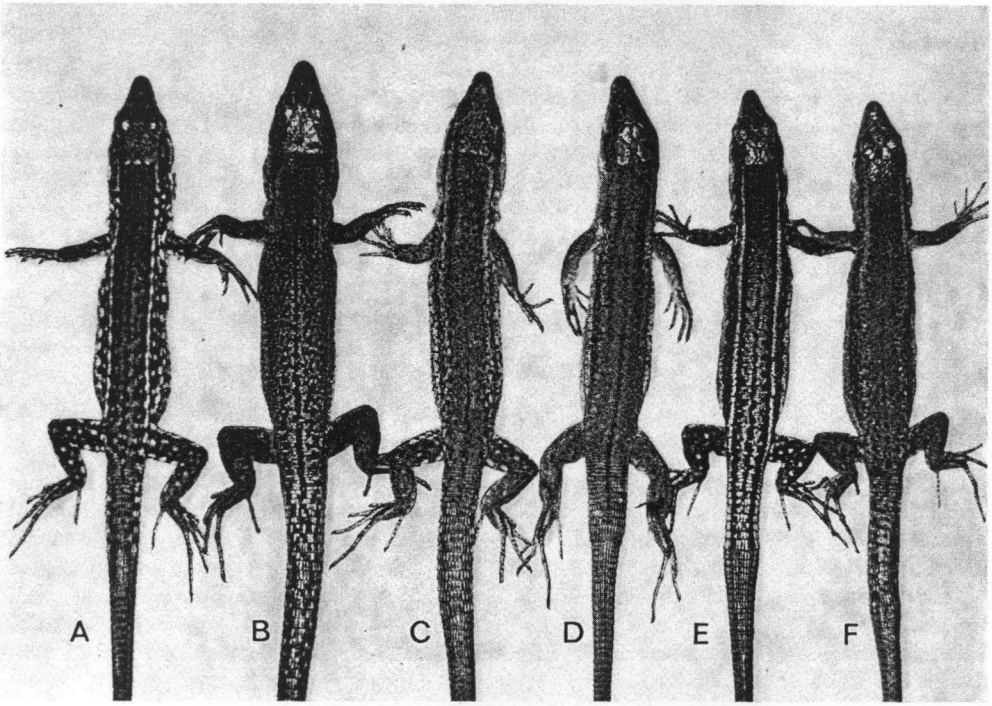

Fig. 1. — *Podarcis muralis contii* subsp. nova from Piana di Cavallo Island. A) ♂ n. 18894 M. F. (striated); B) ♂ 18908 M. F. (moderately reticulated); C) ♂ 18914 M.F. (dorsal pattern reduced); D) ♂ 18913 M.F. (holotype; dorsal pattern nearly absent); E) ♀ 18929 M.F. (intermediate); F) ♀ 18933 (dorsal pattern reduced). We wish to point out that the « salt and pepper » type of reticulation of the ♂ 18908 (B) is not likely to be found in the Corsican-Sardinian *Podarcis muralis;* this specimen already shows a trend towards the reduction of the dorsal pattern. (Photo R. Innocenti; freshly killed specimens).

Paratypes: 71 specimens; 33 ♂♂ n. 18894-18922, 18927, 18936-37 and 18939 M.F., 13 ♀♀ n. 18923-26, 18928-35 and 18938 M.F., same data as for the holotype; 18 ♂♂ n. 19592-19609 M.F., 8 ♀♀ n. 19610-17 M.F., Benedetto and Marco Lanza, Rodolfo and Riccardo Simoni leg. 9.VIII.1974.

Derivatio nominis: We take pleasure in dedicating this new form to our friend Mr Baldassarre Conti, assistant editor of Monitore Zoologico Italiano, for his invaluable help in our research in Corsica (1971-1975).

Diagnosis: A small (maximum body length: ♂ 56 mm, ♀ 53 mm) insular race of a *tiliguerta*-like *Podarcis muralis* characterized by the presence of numerous light coloured phenotypes (about 40%) with a more or less strongly reduced dorsal pattern.

Description of the holotype (Figs. 1 D, 2 D): Small, rather platycephalous. A small anomalous plate between frontoparietals, interparietal

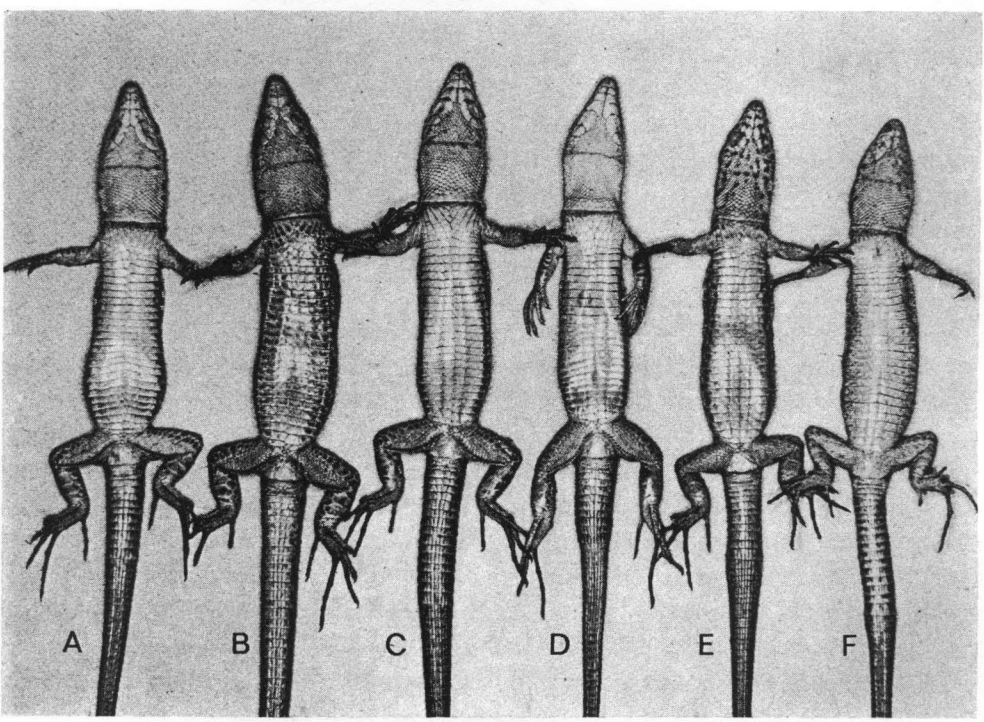

Fig. 2. — *Podarcis muralis contii* subsp. nova.
Ventral aspect of the specimens of Fig. 1.

and right parietal. Nasals form a suture behind the rostral. 6/5 supraciliaries; 11/12 supraciliary granules; 1st supraciliary in contact with the 2nd supraocular; occipital triangular, as long as the interparietal and

about 1.5 times wider; 4 supralabials in front of the subocular; large *tympanicum* and *massetericum*, the latter one in contact with the supratemporals on the right side and separated from them by a row of temporals on the left one; 6/6 supratemporals; 29 gulars; 10 collar scales. 59 midbody scales. Ventrals in 6 longitudinal and 27 transverse rows; 21/21 femorals pores and 32/32 subdigital lamellae under the 4th toe. Pileus light hazel-grey finely dotted with black; dorsum light Havana-brown with a olive-green nuance posteriorly and only a trace of dark vertebral stripe along the posterior third of the trunk and the root of the tail; dorsal and lateral parts of the tail olive-green, hazel-grey in the regenerated portion; sides of the head and neck hazel-grey with some blackish spots on the loreals, upper labials and temporal region; rostral, supranasals and anterior upper labials light greenish; sides of the trunk olive-green with rare scattered black scales and a light brown maxillary band extending on the root of the tail; ventrals parts off-white, with a greenish yellow shade on the distal part of the trunk, tibial part of the hindlimbs and unregenerated tail; dorsal side of the forelimbs and hindlimbs light Havana-brown and olive-green respectively with black dots; underside of the regenerated tail very light grey; outer ventral rows soffused with pale and dark brown and with two sky-blue spots on the righ side; axillary spot poorly developed, formed by few olive-green scales partially surrounded by dark brown scales.

Measurements (in mm): from tip of snout to vent = 56; tail regenerated; pileus length = 13.0; width of head = 8.3; depth of head = 6.3; forelimb = 17.0; hindlimb = 30.0.

Description of the paratypes (Table 1; Figs. 1-2): In general the morphological characters of the paratypes correspond rather well to those of the holotype, except for the usual sexual differences; the data on their lepidosis are summarized in the Table 1.

Scutum tympanicum and *scutum massetericum* are always well developed; the latter one is usually in contact with the supratemporals or separated from them by one, sometimes 2, rows of temporals.

The following head scutellation anomalies were found in the paratypes (l = left, r = right):

1) first supraocular divided in two parts: ♂ 19601 (r), ♀ 19616 (l);
2) first supraocular fused with the first supraciliar: ♂♂ 18966 (l), 18917 (l);
3) 4th supraocular divided in two parts: ♂♂ 18894 (l, r), 19592 (l), 19602 (l), 19605 (l);
4) three supralabials in front of the subocular: ♂♂ 18902 (r), 19609 (r), ♀ 18928 (r);
5) five supralabials in front of the subocular: ♂♂ 18900 (l), 18922 (r), 19600 (l), 19608 (l), ♀ 18938 (r);

6) second and third supralabials partially fused together: ♀ 19615 (r);
7) second, 3rd and 4th supralabials partially fused together: ♀ 18933 (r);
8) one supernumerary supralabial plate (not reaching the buccal rim) between second and third supralabials: ♂ 18906 (r);
9) one supralabial plate (not reaching the buccal rim) between 3rd and 4th supralabials: ♂ 18906 (r);

TABLE 1. — Lepidosis of *Podarcis muralis contii*.

	♂♂ (51 specimens)	♀♀ (21 specimens)
1	56-72 (63,11)	54-67 (61,04)
2	24-29 (26,11)	26-30 (28,23)
3	8-12 (9,58)	8-11 (9,09)
4	25-33 (29,47)	25-33 (28,90)
5	l: 19-27 (22,83) r: 19-26 (22,70)	l: 19-25 (22,33) r: 19-25 (22,04)
6	l: 27-33 (29,91) r: 27-33 (29,71)	l: 28-33 (29,82) r: 28-33 (29,89)
7	l: 5-8 (6,00) r: 4-7 (5,82)	l: 4-6 (5,70) r: 5-7 (5,80)
8	l: 7-14 (10,62) r: 8-14 (10,47)	l: 7-13 (10,30) r: 8-13 (10,55)
9	l: 4-9 (5,78) r: 4-9 (6,15)	l: 4-9 (5,70) r: 3-8 (5,80)

Number (extremes and mean) of:

1) dorsal scales in a transverse series halfway between axilla and groin;
2) ventral scales in a longitudinal series not including the last row of scales which are clearly larger than the preanal ones but irregularly placed;
3) collar scales;
4) gular scales in a longitudinal series;
5) femoral pores;
6) subdigital lamellae of the 4th toe;
7) supraciliaries;
8) supraciliary granules;
9) supratemporal scales. (l = left; r = right).

10) some supraciliary granules fused with the supraciliaries: ♀ 18933 (l);
11) anterior loreal divided in two parts: ♀ 18928 (r);
12) a small plate (deriving from anterior loreal) between anterior loreal and postnasal: ♂ 19595 (r);
13) anterior and posterior loreal fused together: ♂ 19603 (l);
14) posterior loreal divided in two parts: ♂♂ 18906 (l, r), 19599 (l), 19601 (l), 19608 (r);
15) posterior loreal partially fused with the prefrontal: ♀ 18933 (l);
16) postnasal divided in two parts: ♀♀ 18928 (r), 19613 (r);
17) a small plate in the middle of postnasal, frontonasal and anterior loreal: ♂ 19598 (r);
18) frontonasal in contact with the frontal: ♂♂ 18896, 18908, 18936, 19609;
19) first supratemporal very long and fused with the parietal: ♂ 19602 (l);
20) a small plate in the middle of 4th supraocular, parietal and frontoparietal: ♂ 19592 (l), ♀ 19615 (r);
21) a small plate (deriving from parietal) between parietal and posterior supratemporals: ♂ 19601 (r);
22) interparietal divided in two parts: ♂ 18908;
23) interparietal not touching the occipital because of the interposition of the parietals: ♂♂ 18901, 18907, 18910, 18919, 18936, 19592, 19598, 19599, 19600, ♀ 18925;
24) a small plate between interparietal and occipital: ♂♂ 18894, 18896, 18903, ♀ 18931;
25) occipital partially fused with the parietal: ♂ 19599 (l);
26) interparietal and occipital region fragmented: ♂♂ 18895, 18900;
27) occipital lacking: ♂♂ 19595, 19607;
28) *pileus* extensively fragmented: ♀ 19611;
29) a small plate between frontoparietals, interparietal, and parietal: ♂ 18913 (r).

According to the dorsal pattern of the trunk, the members of the new subspecies can be roughly divided in two groups: one, containing about 60% of the individuals, includes the usual striped or reticulated phenotypes, and one, containing the remaining 40% of the animals, includes light coloured phenotypes in which the dorsal pattern is more or less strongly reduced (Fig. 1 C, D, F). « Zeichnungslos » or tendentially « zeichnungslos » specimens like these are of rare occurrence in the Corsican-Sardinian *Podarcis muralis*. MERTENS (1915, p. 91) writes: « Mir ist in meinem Material von 300 Stück [from Sardinia] kein einziges Mal solch ein Tier mit verloschener resp. undeutlicher Zeichnung begegnet. »; among the 1811 specimens studied by us (918 ♂♂ and 526 ♀♀ from Corsica and satellite islands; 235 ♂♂ and 132 ♀♀ from Sardinia and satellite islands) only the above-mentioned specimens from Piana di Cavallo Island and a male from Pinarello Island (LANZA, 1977, Fig. 1, specimen at the right) have a strongly reduced dorsal pattern. Only MERKEL (1915, p. 79) found « bei Calacuccia [N.W. Corsica, about 800 m,

09° 03′ E - 42° 20′ N] zahlreiche, fast einfarbig helle, kaffeebraune Männchen (Tafel I. Abb. 2 rechts); doch waren auch hier diese bei weitem nicht in der Mehrzahl, nur bedeutend häufiger als sonst. Immerhin könnte es sich hier um den ersten Anfang zur Bildung einer Lokalrasse handeln. ». The percentage of the different dorsal patterns follows (for

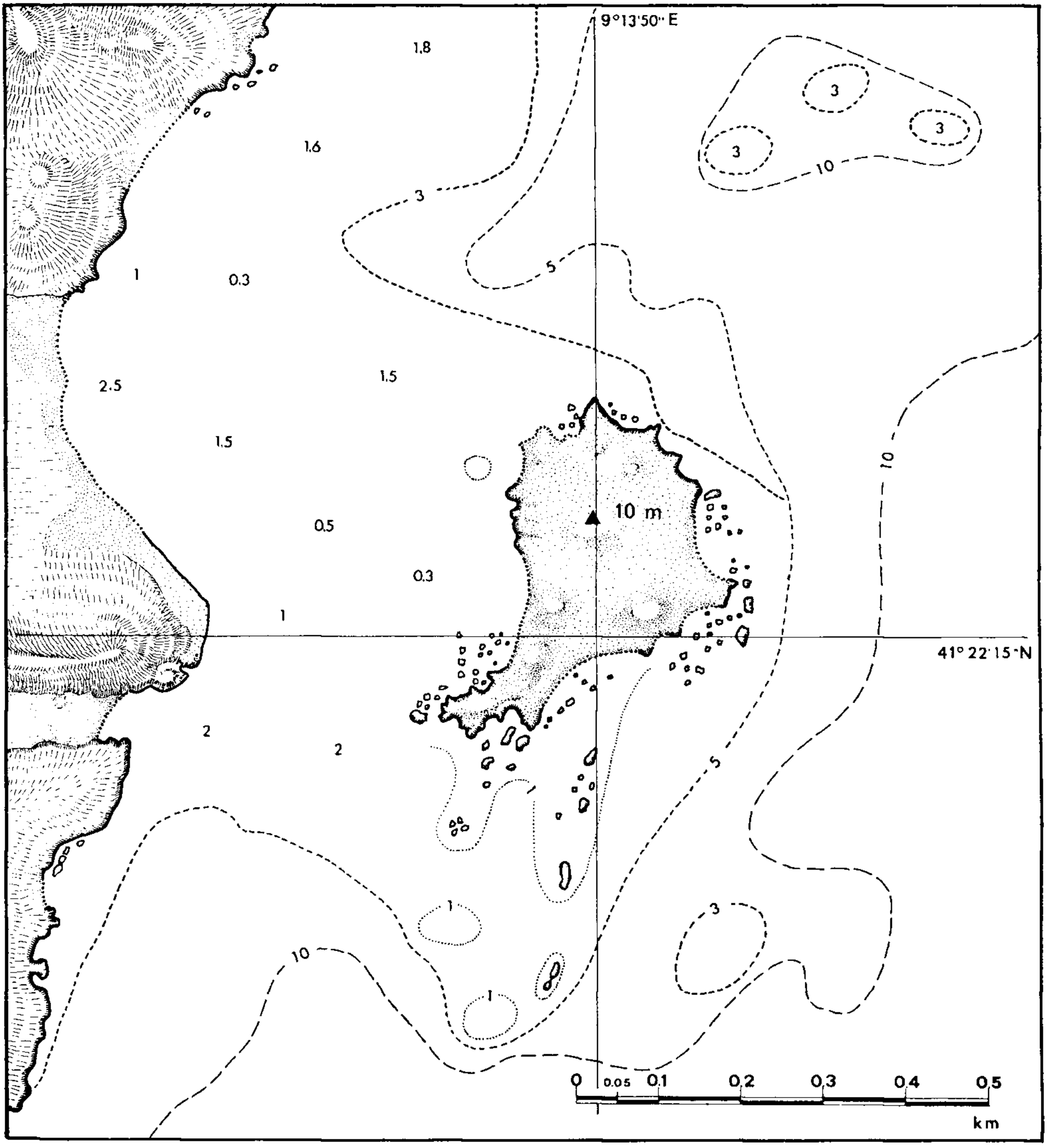

Fig. 3. — Map of the Piana di Cavallo Island.

definition of striped, intermediate and reticulated types see LANZA, 1972, p. 371 or LANZA & BRIZZI, 1974, pp. 158 and 162):

	♂♂	♀♀
striped	41.17	61.90
intermediate	9.80	4.76
reticulated	5.88	0.00
reduced	43.13	33.33

No specimen shows the strongest reticulation found in the Corsican-Sardinian *Podarcis muralis*. *Pileus*, sides of the head, sublabials and outer ventrals (also in the animals with reduced pattern) more or less spotted with dark colours; a few specimens have some brown spots or shadings on the intermediate ventral rows. The throat is usually immaculate or with a few grey or brown dots, rather heavily spotted in rare specimens (Fig. 2 E). Total number of lateral blue spots between axilla and groin (counted on both sides, even if occupying one scale only) 0-25 (mean 3.27) in the ♂♂ and 0-5 (mean 0.66) in the ♀♀. Ventral parts mostly white or whitish, sometimes with a greenish, flesh-coloured or, more often, yellowish nuance; a few animals of both sexes (about 4%) have bright yellow underparts.

Measurements (in mm): 1 - from tip of snout to vent; 2 - tail length; 3 - *pileus* length; 4 - width of head; 5 - depth of head; 6 - length of forelimb; 7 - length of hindlimb.

	1	2	3	4	5	6	7
♂ n. 18915	51	106 (reg.)	12.7	8.5	5.8	19.0	32.0
♂ n. 18918	49	109	12.2	7.6	5.7	18.0	29.0
♀ n. 18935	52	reg.	11.6	7.5	5.2	16.0	26.0
♀ n. 19611	53	reg.	11.8	7.6	4.9	16.0	26.0

Notes: The basement of Piana di Cavallo Island is rocky (granite diorite) and stands barely above sea level, rising out of a sandy shoal. For this reason sandy deposits have progressively covered the rocky part, which today is practically hidden under a thick layer of sand, a situation probably dating back a few thousand years. The *Podarcis muralis* population inhabiting the primitive rocky island has thus gradually been forced to live on a substrate completely different from that to which the species is generally bound due to its ecological requirements. It is possible that natural selection favoured, through reduction of predation, the mutants blending with the sandy substrate (for selective significance of cryptic colouration in sandy environment see f.i. HARRISON, 1975).

We do not know any other population of *Podarcis muralis* living in a open sandy environment like that of Piana di Cavallo Island. In fact, some littoral Italian populations of this species frequent sandy substrates only if occupied by human constructions or trees (f.i. Holm Oak, *Quercus ilex* L.) which offer a substitute rocky-like substrate.

According to ZEVACO'S (1969) and our data about 70 species of vascular plants live on the island. Low shrubs, such as *Juniperus phoenicea* L., *Pistacia lentiscus* L., *Myrtus communis* L., *Phyllyrea angustifolia* L. and *Cistus incanus* subsp. *corsicus* (Loisel.) Heywood, densely cover the highest parts, while a sparse, mostly grassy vegetation, alternated with open sandy areas, occurs on the remainder of the island.

Piana di Cavallo Island (09° 13′ 50″ E - 41° 22′ 15″ N) (Fig. 3) is 10 m high, measures 450 × 250 m and has a surface of 64.500 m²; a channel 300 m wide and 1 m deep divides its southwestern extremity from the nearest Corsican coast.

We wish to thank Marco Lanza, Fabio Sammicheli, Riccardo Simoni and Dr. Rodolfo Simoni for their help in collecting on the island, as well as Mr C. Ricceri (Istituto Botanico of the University of Florence) for having identified the plants.

REFERENCES

BRIZZI R. & LANZA B., 1975 - The natural history of the Macinaggio Islets (northeastern Corsica) with particular reference to their herpetofauna. *Natura*, Milano, 66, n. 1-2, pp. 53-72, 8 figs.

HARRISON D. L., 1975 - Desert coloration in rodents (pp. 269-276, 2 figs). In: PRAKASH I. & GHOSH P. K. (Editors) - Rodents in desert environments. *W. Junk*, The Hague, pp. XVI + 624, many figs.

LANZA B., 1972 - The natural history of the Cerbicale Islands (southeastern Corsica) with particular reference to their herpetofauna. *Natura*, Milano, 63, n. 4, pp. 345-407, 26 figs.

LANZA B., 1976 - On a new Wall-Lizard from Corsica, with notes on the Sanguinarie Islands (*Reptilia Lacertidae*). *Natura*, Milano, 67, n. 3-4, pp. 185-202, 12 figs.

LANZA B. & BRIZZI R., 1974 - On two new Corsican microinsular subspecies of *Podarcis tiliguerta* (Gmelin, 1789) (*Reptilia Lacertidae*). *Natura*, Milano, 65, n. 3-4, pp. 155-193, 54 figs.

MERKEL E., 1915 - Corsisehe Lacerten. *Bl. Aquar. Terrarienk.*, 25 (1914) (Sonderhefte), pp. 75-82, 5 figs, 4 pis.

MERTENS R., 1916 - Studien zur Systematik der Lacertiden. I. Teil: Untersuchungen über die Variabilität der italienischen Mauereidechsen (*Lacerta muralis* Laur. und *Lacerta serpa* Raf.). Inaugural-Dissertation zur Erlangung der Doktorwürde der Hohen Philosophischen Fakultät der Universität Leipzig. *Friedländer*, Berlin, 437 pp., XXIV pis.

ZEVACO C., 1969 - Étude phytosociologique des plages et des dunes des archipels des Lavezzi et des Cerbicale (sud et sud-est de la Corse). *Annls Fac. Sei.* Marseille, 42, pp. 111-130.