Beach sediments provenance and dispersal in the Lucania coast (Southern Italy)

by

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Résumé

La détermination de la provenance des sédiments de plage permet de distinguer les différentes zones pétrographiques sédimentaires (unités naturelles) d'une fraction de côte, en montrant par conséquent la direction et l'extension de la dispersion littorale. Dans ce but et avec la seule intention d'effectuer une étude d'encadrement régional, on a réalisé l'échantillonage des alluvions du lit des cours d'eau les plus importants et des sédiments de plage d'un secteur du littoral ionien.

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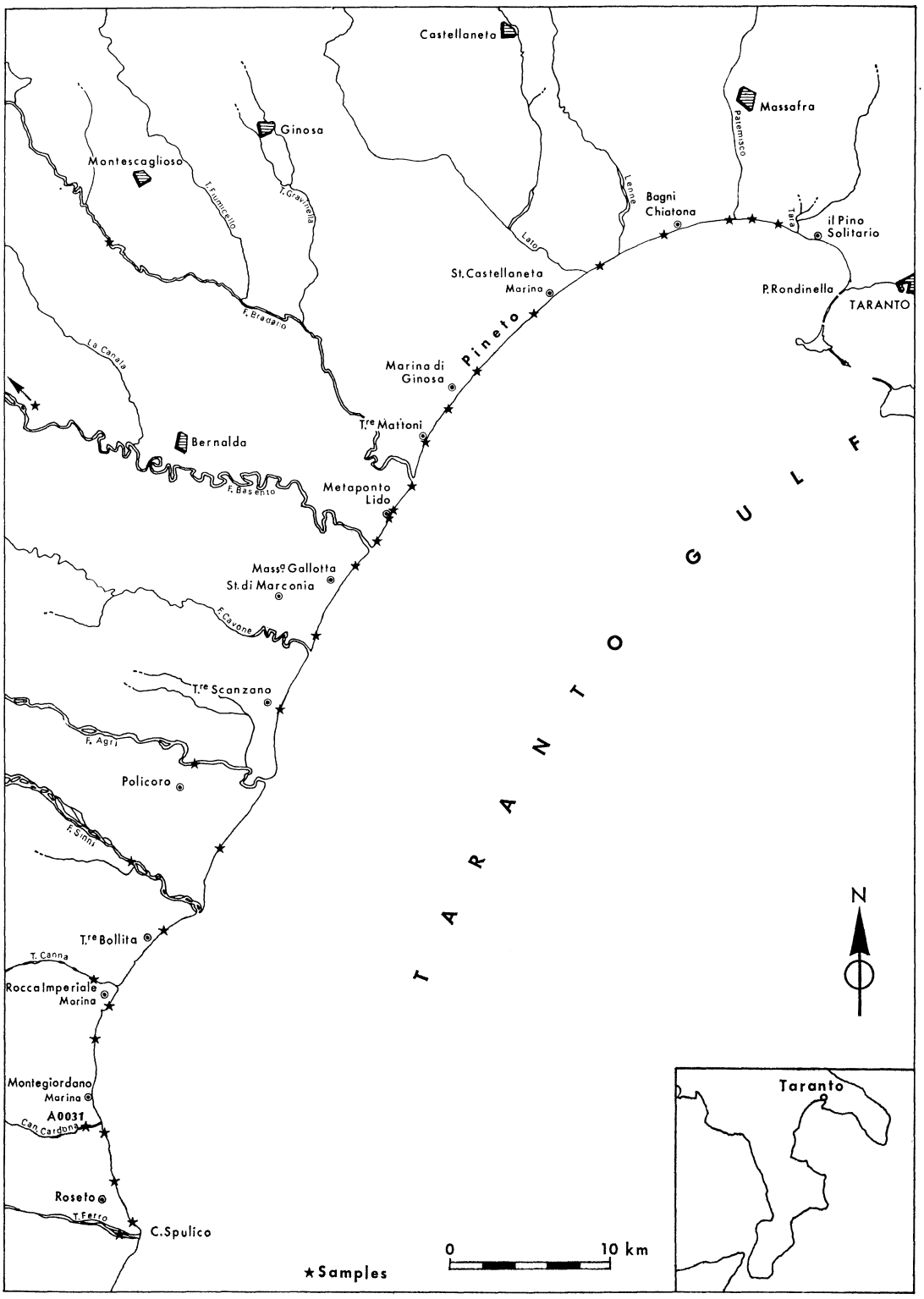
Introduction

The north-western coastline of the Taranto gulf, ranges for about 100 km from Capo Spulico to Punta Rondinella, and represents a single sedimentary petrological province. In the southern part of the area the beach, which is shouldered by cliffs, is narrow and gravelly; becoming, further to the north, pebbly-sandy and finally sandy starting from the mouth of the Agri river. Coastal dunes appear close to the north of Sïnni, which then surround the coast as far as the northern end.

Sediments composition

The channel sands of the Ferro and Cardona torrents are very rich in rock fragments, the carbonatic ones (with dolomite traces) being more abundant than igneous ones. Among the heavy minerals remarkable quantities of barite (about 50 %) were found. These data are true also of the sediments of the beach portion extending from Capo Spulico to Montegiordano M. to make up a first of five natural units. The channel sands of the Sinni and Canna streams show a percentage increase of quartz and plutonic rock fragments inversely proportional to the arenaceous and siltitic ones when compared with the above mentioned first area, besides a higher incidence of dolomite in the carbonatic portion. The heavy minerals suite is characterized by high garnet contents and, in the case of the Sinni, by the presence of epidote and diallage; the pyroxene content appears comparatively high while the hornblende one reaches its maximum value, averaging 7 %. In this area in fact, the hydrographic net reaches also ophiolitic rocks and Plio-Pleistocene sediments. Such petrographic features are typical of the beach sediments ranging from Montegiordano M. to Lido di Policoro (second natural unit). The Agri sands show several petrographic peculiarities, which are found as far as the beach of the Marconia St. (third natural unit). In comparison with streams and beaches further south, sudden decreases appear in the heavy minerals and rock fragments content, whereas a reasonable quartz increase is noticed. In particular, alkali feldspars among the light minerals and almost colourless garnet, zircon and brookite among the heavy ones, show frequency distributions which reach maximum values in the whole coastline. The Bradano and Basento streams though showing some significant compositional differences in their sediments, display on the other hand close similarities. Very high quartz contents and very scanty rock fragments are present; the heavy minerals characterize the channel sand samples as containing abundant pyroxenes and glaucophane. Moreover, the Bradano stream transports a great quantity of peculiar dark garnet. These petrographic parameters constitute the significant features of the beaches which extend from the Marconia St. to the Bosco il pineto

Rapp. Comm. int. Mer Médit., **23**, 4a, pp. 303-305, 1 fig., (1975).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T. Fiumicello
T. Gravinella
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Bagni
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Solitario
Leto
St. Castellaneta
Marina
P. Rondinella
TARANTO
F. Bradano
La Canala
Marina di
Ginosa
Pineto
T.re Mattoni
Bernalda
F. Basento
Metaponto
Lido
Mass.a Gallotta
St. di Marconia
F. Cavone
T.re Scanzano
F. Agri
Policoro
F. Sinni
T.re Bollita
T. Canna
Roccalmperiale
Marina
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(fourth natural unit). The northernmost coastline presents no streams with noticeable solid transport. Anyway, the beach sand of this zone constitutes a single well characterized natural unit . In fact, as compared with the mentioned fourth area, quartz diminishes in favour of the alkali feldspars and rock fragments. The presence, even in hardly detectable quantities, of serpentinite fragments appears also characterizing. Among the heavy minerals the contents of pyroxenes (including diallage), hornblende and tourmaline increase, whereas garnet (both light and dark-coloured) and zircon decrease.

Sediments dispersal

In order to establish the direction of longshore transport one may utilize some minerals — mainly the heavy ones — which, exibiting a well defined provenance, behave as very good natural tracers. Diallage (Sinni), staurolite (Agri-Basento), glaucophane (Basento-Bradano) and a dark coloured garnet (Bradano), appear particularly significant. The same indications are provided by epidote, zircon, monazite and sphene notwithstanding their presence in the sands of all the streams. All these data, together with the above reported ones, evidence a dispersion of the materials from SW towards NE, also if limited transport is noticed towards SW by the Sinni and Agri river mouths.

References

BRONDI (A.) *et al.*, 1974. — Deriva delle sabbie del litorale NW del Golfo di Taranto. *Rend. SIMP.* **30**, I, pp. 111-140.