

## Field Study and Geochemical Evolution of the Kargil Plutonic Complex (Ladakh, NW India)

TALK

Y. LEMENNICIER\* & I. REUBER\*\*

The Kargil Plutonic Complex (KPC) is intrusive in the volcano-sedimentary formations of the Dras arc which are considered, by all authors, as an eastern extension of the Kohistan arc series.

During summer 1991, we have mapped in detail an area of approximately 100 Km<sup>2</sup>, just west of Kargil. Based on the field observations (see map), we have been able to distinguish two units separated by a thrust, striking N140° with a steep SW dip. This thrust has been already described by Sharma (1990, "Kirkichu Thrust"), near the Chanigund village where it is a submeridian fault. In all the mapped area, the thrust reactivates an older large shear-zone followed by metadolerites and by a large lens of metapelitic gneiss. The cleavage in the gneiss is nearly vertical, striking N110°E to N150°E, and shows a stretching lineation with a weak plunge between 0° and 20° in either direction.

The SW unit is essentially composed by the Somau granodiorite, which intrudes the Dras1 formations (Reuber, 1989). An acicular amphibole-bearing diorite, intrudes the granodiorite on its eastern side. The Somau granodiorite (103±3 Ma by U-Pb method on zircon: Honegger, 1982), is characterised at the outcrop scale by a penetrative cleavage, underlined by biotite and amphibole. Foliation spreads from N110° to N140° with a steep NW dip. However, it has not been possible to define clearly, in the granodiorite as in the gneiss, the shear sense of movement.

The NE unit is composed by several plutons of varied composition, from granite to cumulative gabbro, intrusive into Dras1 formation. The most important one is the Rinak pluton which displays a quartz-gabbro rim and a quartz-diorite center. In these plutons, the fabric corresponds to a rather fuzzy magmatic foliation.

An andesitic dyke-swarm cutting all the older structures, is affected by a late reactivation of the N 140° thrust. The statistical best orientation of the dyke walls is N40°E, subvertical.

A geochemical study based on 19 new analyses including 10 andesite dykes, completed by published data (Honegger, 1982; Sharma, 1990), leads to the following conclusions:

(i)- the Dras I volcano-sedimentary formation defines a tholeiitic trend of immature Island Arc type;

(ii)- the KPC plutonics, intrusive in Dras I defines, as a whole, a subalkaline trend with calkalkaline affinities;

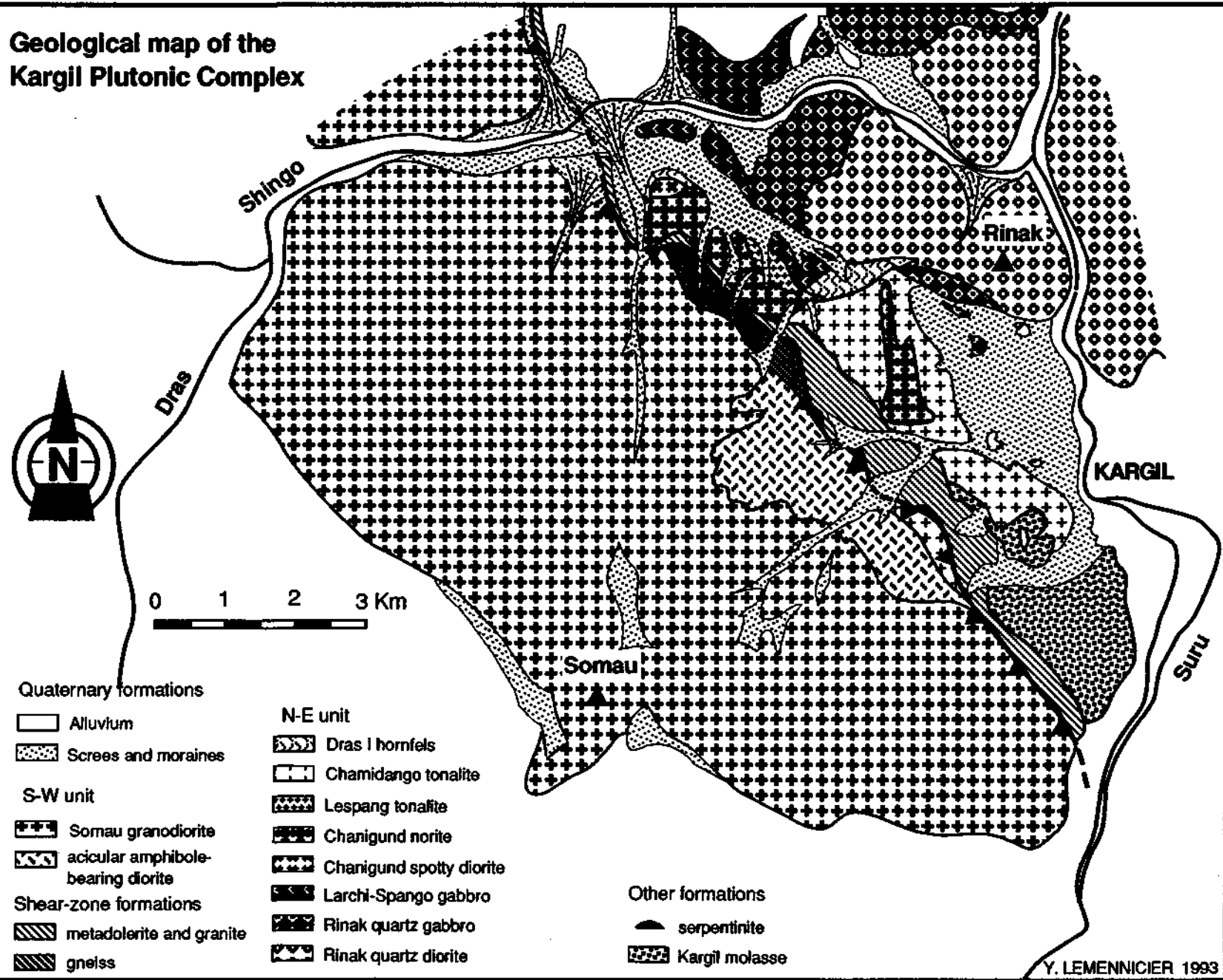
(iii)- the andesitic dyke swarm displays a calkalkaline trend of mature arc with continental affinity.

Thus we can follow, in the Dras Arc, a magmatic evolution from oceanic IAT to continental calkalkaline arc magmatism. This evolution meets the conclusions previously obtained by G. Reibel (1984). Considering the deformation differences between the Somau granodiorite on one side and the NE plutonics on the other one, leads us to suggest that the Arc-Eurasia collision occurred during the plutonic activity of this arc.

\*) Institut Dolomieu, 15 rue de Maurice Gignoux, 38031 Grenoble Cédex, France

\*\*\*) Disappeared in Pakistan since Oktober 1991

# Geological map of the Kargil Plutonic Complex



Y. LEMENNICIER 1993