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Reporting of gold anomaly and showings of lapis-lazuli from Chakdara granite gneiss and its environs, district Dir, northern Pakistan

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Abstract

The Chakdara granite gneiss, covering an area of 60 Km^2, is located north of Malakand granite. This granite gneiss was investigated for its potential of economic minerals. During this investigation, besides locating several occurrences of fluorite and blue beryl, a gold bearing-sulfide vein is also present near the contact of Chakdara granite gneiss and metasediments. Chemical analysis shows poly-metallic nature of the vein with significant concentration of Cu, Pb, Zn and Au. A gem quality lapis-lazuli of deep blue color is present in a marbleized limestone at the eastern contact of Chakdara granite gneiss and metasediments. It occurs in the form of small pods, a few cm across, and found as replacement deposits.

1. Introduction

The Chakdara granite gneiss (Fig. 1), covering an area of 60 km^2, is located north of Malakand granite and is considered to be the extension of Swat granite gneiss (Martin et. al., 1962). Chaudhry et al. (1974) considered this granite gneiss to be older than Malakand granite. The rocks are homogeneous, medium to coarse-grained biotite-muscovite-plagioclase- quartz- feldspar granite gneisses, locally with magnetite patches. Recent studies based on field relationship by Khaliq et. al. (2003), indicate that the Chakdara granite gneiss is an older phase of Malakand granite and it shows continuity with the latter across river Swat at Matkani locality where its exposures can be seen along river beds. Moreover, it also shows similarity to the western part of Malakand granite (recently named as Hazar Nao granite by Khaliq et al., 2003) in Kot area because both contain younger batches of granite intruding the older granite gneisses and have similarity in the mineralogy of their pegmatites and occurrences of fluorite and blue beryl.

This paper reports the occurrence of a gold-bearing sulfide vein in the Chakdara granite gneiss and gem quality lapis-lazuli in the contact zone of Chakdara granite gneiss for the first time.

The sulfide-bearing vein is located near the eastern contact of Chakdara granite gneiss and metasediments at Shamlay locality at NGR 025683 (Fig.1). The contact at this locality is highly sheared and contains several quartz veins with visible weathered pyrite. Moreover, quartz veins and pegmatites in the area also contain fluorite in close association with blue beryl (Khaliq et al., this volume). A gem quality lapis-lazuli is found at the contact zone between metasediments and Chakdara granite gneiss (Fig. 1).

2. Gold bearing sulfide vein

The newly discovered sulfide-bearing vein (about 30cm thick) with gold anomaly is found along a sheared alteration zone (about 80cm thick) with high concentration of sericite. This shear zone is following the regional trend of lithologies. The vein is found in the granite gneiss near its contact with metasediments. It contains fine-grained visible sulfides. The material from the vein has high density and is greenish and dark-brownish in colour. Chemical analysis of a sample from the sulfides vein shows that it contain 2.8ppm Au, 25ppm Cu, 10ppm Pb, and 30ppm Zn.

3. Lapis-lazuli bearing marbleized limestone

Lapis-lazuli is present in a quarry of marbleized limestone near the contact zone of metasediments and Chakdara granite gneiss (Fig. 1). It occurs as replacement material. Marbleized limestone is several tens of meters thick and bounded on both sides by schists and is following the regional trend of lithologies. Lapis-lazuli is deep blue in color and looks much superior than a well known lapis-lazuli of Panjsheer valley of Afghanistan. Patchy pyrite of bright golden colour is also associated with it.

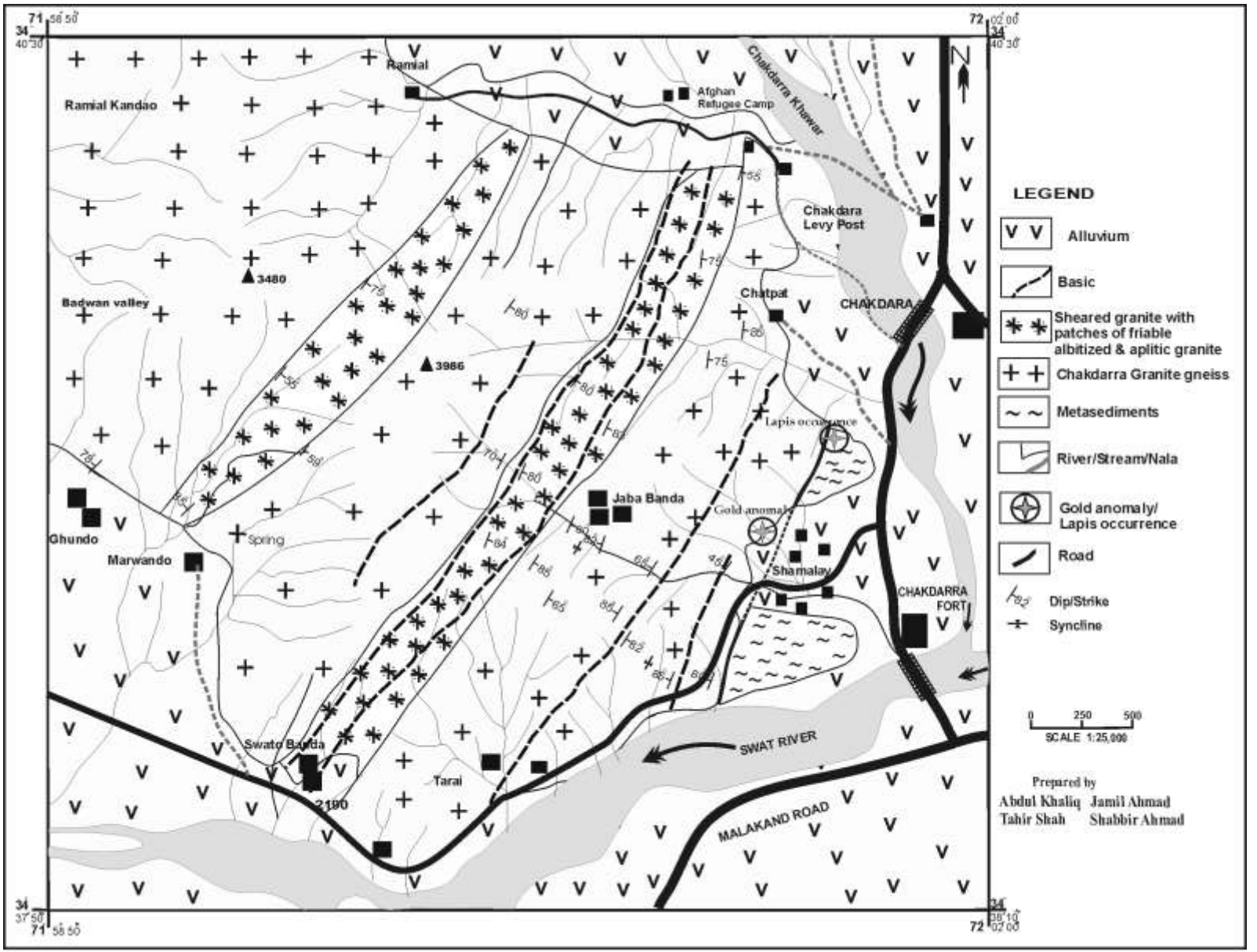

Fig.1. Geological map of the eastern part of Chakdara granite gneiss with locations of gold anomaly and lapis-lazuli showings.

4. Discussions and conclusion

Finding of gold bearing-sulfide vein and gem quality lapis-lazuli in Chakdara granite gneiss and it's environ indicates its potential for economical minerals of both metallic and gem types. Although, the newly reported gold bearing sulfide vein and lapis-lazuli were discovered during a survey for fluorite mineralization, nevertheless, a comprehensive survey with updated technique would probably lead to the discovery of more such occurrences in the area because such occurrences are never found in isolation but their presence in an area, generally, shows the signatures of suitable environment for similar types of mineralization. It is hoped that these discoveries will open a new avenue in the area for the prospectors and exploration geologists.

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