UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

THE USE OF PLANTS IN PROSPECTING FOR PRECIOUS METALS, PRINCIPALLY GOLD--A SELECTED BIBLIOGRAPHY AND TOPIC INDEX

By

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Introduction

The purpose of this bibliography on the biogeochemical exploration for precious metals is threefold: (1) to provide a compilation of an extremely timely subject (gold is currently a commodity of major interest), (2) to dispel the impression that studies on the response of plants to gold mineralization are quite limited; and (3) to provide a listing of more complete and more accurate citations than can be obtained from existing bibliographic data bases.

As our literature search and the resulting limited bibliography show, an impressive number of studies exists on the subject. Fifty of the 131 references cited originate in the Soviet Union, and, unfortunately, most appear only in Soviet journals. Few of the papers have been translated. An example of the extent of this work can be seen by scanning the bibliography of Ivashov (1976), a book on biogeochemical exploration methods used in the far eastern territory of the USSR.

For the most part, the references listed here were retrieved in a literature search conducted on June 12, 1984, through the facilities of the U.S. Geological Survey's library. The main search service was DIALOG Information Services[1]. Ten data bases were searched under the general title "Use of plants in prospecting for precious metals." The search criteria were precious metals, gold, platinum, palladium, plant(s), vegetation, tree(s), flora, botany, humus, mull, sap, biogeochemistry, geobotany, and prospecting. The following data bases (earliest year of citations contained in data base is given in parentheses) yielded 189 references, some of which were duplicates: GEOREF (1929), GEOARCHIVE (1969), COMPENDEX (1970), CHEMICAL ABSTRACTS (1967), and SCISEARCH (1974). No applicable citations were found in BIOSIS, METADEX, SSIE, FEDERAL RESEARCH IN PROGRESS, and COMPREHENSIVE DISSERTATIONS ABSTRACTS. Of the 189 references, about 100 were selected for inclusion in this bibliography. GEOREF and CHEMICAL ABSTRACTS were clearly the most productive data bases. Many of the references that were not appropriate resulted from the fact that one of the search criteria, "plant," also refers to a mining facility (for example a "flotation plant"). Other inappropriate references related to mine reclamation, or similar environmental subjects. We even encountered papers that dealt with geologic formations with plant names (for example, the Fig Tree Formation in South Africa).

This bibliography has three basic limitations. First, with the exception of GEOREF, the data bases include only relatively recent references. However, we have included what we judge to be some of the important earlier papers on gold in plants (Lungwitz, 1900; Kropachev, 1935; and Babicka, 1943). Lungwitz is probably the first to relate the gold content of plants to underlying mineralization. Second, the completeness of the references varied greatly in the data bases. We have therefore included some references that are not as complete as we would like them to be, but we feel that they are important enough to be included here. The third limitation is our not including all

[1]Any use of trade or company names is for descriptive purposes only and does not imply endorsement by the USGS.

appropriate references that were cited in the papers that we have listed. Such a task is almost limitless, or at least exceeds the time we were able to dedicate to the effort.

The initial section of the bibliography lists the references alphabetically by author. We have included a number of general references on methods of biogeochemical prospecting (Malyuga, 1964; Brooks, 1972, 1983; Kovalevskiy, 1979; Levinson, 1980; and Rose and others, 1979, chap. 17). Several monographic papers by Boyle (1968, 1979) and by Boyle and Jonasson (1973, 1984) are invaluable due to their extensive bibliographies that draw heavily on foreign literature.

A second section lists most of the references, alphabetically by topics that we judged to be of more immediate use to the explorationist interested in using plants to aid in locating mineral occurrences. The selection of topics is admittedly arbitrary, but we hope not capricious. The topic on humus may not seem quite appropriate, but nevertheless does relate to mineral cycling in plants.

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