

PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA
Ministry of Higher Education and Scientific Research
Badji Mokhtar Annaba University
Faculty of Earth Sciences
Mining Department



4TH INTERNATIONAL SEMINAR ON MINING INDUSTRY AND ENVIRONMENT

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Abstract Book



FOREWORD

The Fourth International Seminar on the Mineral Industry and Environment (4SIMINE'23) organized by the mining department of Badji Mokhtar University - Annaba, from November 7 to 9, 2023 aims to make the mining sector more attractive. Today this sector occupies an important place due to its very diversified mining resources and its considerable potential especially in iron ores of Gara Djebilet (Tindouf), phosphate of Bled El Hadba (Tebessa)), lead and zinc of Oued Amizour (Bejaia) and gold from El-hoggar (tamanrasset), However, updating geological and mining infrastructure will make it possible to meet market requirements in terms of marketable products.

At a time when pressures on the environment and the costs of mining and mineral processing continue to increase, the integrated management of mining waste is a key to the success of restoration and rehabilitation of sites mining and environmental protection.

Moreover, the valorization of mining waste which contains many useful minerals (lead, zinc, copper, gold, silver, rare earth elements, precious minerals, etc.) could change our methods of mining and management of mineral resources.

Dear industrials from the SOMIPHOS and SOMIFER companies as well as the Thematic Agency for Research in Science and Technology (ATRST), we would like to sincerely thank you for your financial support for our scientific event, thank you for your valuable contribution.

We sincerely thank the organizing staff and the scientific committee for their excellent collaboration, an indicator of success 4simine'23.

Many thanks to all participants in this event for their scientific contributions (plenary, oral and poster) through their current work in the field of mining sciences and the environment.

Pr. BOUNOUALA Mohamed

SCIENTIFIC COMMITTEE CHAIR

<http://lavamine.univ-annaba.dz>

مقدمة

أن المؤتمر الدولي الرابع حول الصناعة المعدنية و البيئة المنضم من طرف قسم المناجم بجامعة باجي مختار – عنابة من 7 إلى 9 نوفمبر 2023 يهدف إلى جعل قطاع المناجم أكثر استقطابا، هذا القطاع الذي يحتل حاليا مكانة هامة على المستوى الوطني، بفضل موارده المنجمية المتنوعة للغاية وإمكاناتها الكبيرة وعلى وجه الخصوص، خامات الحديد لغار جبيلات (تيسة)، فوسفات بلاد الهدبة (بتيسة)، الرصاص والزنك بوادي أميزور (بجاية)، والذهب في الهقار (تندوف). ومع ذلك، فإن تحديث البنية التحتية الجيولوجية والمنجمية سيجعل من الممكن تلبية متطلبات السوق من حيث المنتجات القابلة للتسويق.

وفي الوقت الذي تتزايد فيه الضغوط على البيئة وتكاليف الاستغلال ومعالجة المعادن باستمرار، فإن الإدارة المنسجمة والمتكاملة لمخلفات الاستغلال هي مفتاح النجاح في إعادة تأهيل وترميم المواقع المنجمية وحماية البيئة.

علاوة على ذلك، فإن إعادة تثمين النفايات المنجمية التي تحتوي على العديد من المعادن المفيدة (كالرصاص، الزنك، النحاس، الذهب، الفضة، العناصر الأرضية النادرة والمعادن الثمينة وما إلى ذلك) يمكن أن يغير في الطرق والأساليب المتبعة في الاستغلال وإدارة الموارد المنجمية.

أعزائي الصناعيين من شركتي مناجم الفوسفات (SOMIPHOS) و مناجم الحديد (SOMIFER) بتيسة وكذلك الوكالة الموضوعاتية للبحث في العلوم والتكنولوجيا (ATRST)، نود أن نشكركم خالص الشكر على دعمكم المالي لحدثنا العلمي، ونشكركم على مساهمتكم القيمة.

نتقدم بالشكر الجزيل لكل أعضاء لجنة التنظيم واللجنة العلمية على تعاونهم الممتاز، وهو مؤشر على نجاح المؤتمر 4SIMINE'23

كل الشكر والتقدير لجميع المشاركين في هذا المؤتمر على مساهماتهم العلمية (الجلسة العامة - التدخلات الشفوية و كذا الملصقات) من خلال أعمالهم الحديثة في مجال علوم المناجم والبيئة.

البروفسور محمد بونواله

رئيس اللجنة العلمية

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AVANT-PROPOS

Le Quatrième Séminaire International sur l'Industrie Minérale et l'Environnement (4SIMINE'23) organisé par le Département des Mines de l'Université Badji Mokhtar - Annaba du 7 au 9 novembre 2023 vise à rendre plus attractif le secteur minier qui occupe, aujourd'hui, une place importante à l'échelle nationale grâce à ses ressources minières très diversifiées et ses potentialités considérables en minerais de fer Gara Djebilet (Tindouf), de phosphate Bled El Hadba(Tebesa), de plomb et de zinc Oued Amizour(Bejaia) et de l'or du Hoggar (Tamanrasset). Cependant, la mise à jour des infrastructures géologiques et minières permettra de répondre aux exigences du marché en matière de produits marchands.

À l'heure où les pressions sur l'environnement et les coûts de l'exploitation et du traitement des minerais ne cessent d'augmenter, la gestion intégrée des rejets miniers est alors une clé de succès de la restauration, de la réhabilitation des sites miniers et de la protection de l'environnement.

Par ailleurs, La valorisation des rejets miniers qui renferment beaucoup de minéraux utiles (plomb, zinc, cuivre, or, argent, éléments de terres rares, minéraux précieux,..) pourrait changer nos méthodes d'exploitation et de gestion des ressources minières.

Chers acteurs industriels des entreprises SOMIPHOS et SOMIFER ainsi que de l'Agence Thématique de Recherche en Sciences et Technologie (ATRST), nous tenons sincèrement à vous remercier pour votre soutien financier à notre événement scientifique, merci pour votre précieuse contribution.

Nous remercions vivement le staff-organisateur et le comité scientifique pour leur excellente collaboration, un indicateur de la réussite et du succès du 4simine'23.

Un grand merci à tous les participants à cet événement pour leur contributions scientifiques (plénière, orale et par affiche) de par leurs travaux d'actualité sur le domaine des sciences minières et l'environnement.

Pr Mohamed BOUNOUALA
PRESIDENT DU COMITE SCIENTIFIQUE
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Geoscience and environment





PRACTICAL EXPERIENCE OF USING INNOVATIVE TECHNOLOGIES IN MODERN AQUACULTURE

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Abstract

The modular system allows you to rationally use resources and obtain high-quality products. The article presents the results of an experimental development of the use of a recirculation system in aquaculture. The results demonstrate a positive effect on production, reducing pollution while maintaining high quality aquaculture products. The modular system uses pumps, biofiltration, aquatic organisms, phytoplants and an alternative energy section (solar panel). Water circulates in a circle; the system is mobile and allows installation anywhere. Tilapia (*Florida red*) was selected as the object of research. Experimental group 1 received supplementary feeding in the form of a formed forage layer with substitute ingredients (%): spirulina (55) + humic substances (20) + iron nanoparticles (15) + lavender (oil) (10). Experimental group 2 received (%): spirulina (70) + humic substances (10) + iron nanoparticles (15) + lavender (oil) (5), but in addition, aquaponics plants and a solar panel were used. A comparison of the growth rate and redistribution of body weight in tilapia before the beginning of the main period of the experimental experiment showed similar indicators. After the start of the experiment, tilapia in the control group had the lowest growth rates for 3 months. At the same time, fish in experimental groups 1 and 2 better accumulated body weight. In experiment 2, the rate of development was higher than experimental group 1 by 35 % and the control group by 42 %. The only functional system in the organism of hydrobionts is aimed at regulating and ensuring the constancy of vital parameters, increasing adaptive capabilities, and in some cases, the ability to globally rebuild the link of adaptive - compensatory mechanisms in order to stabilize vital functions. Therefore, it is important to emphasize the functional status in the process of studying the influence of factors of different nature on the efficiency of fish farming. Thus, the positive effect of optimizing certain aspects of the technological modular system was experimentally demonstrated. The influence of additional elements of biofiltration, feeding and solar panels have a positive effect on the quality and quantity parameters of aquaculture results.

Keywords

Innovative technological, aquaculture, alternative energy sources, RAS model system.