

**Kpan Wokapeu Blaise^{1,2}, Koné Mamidou Witabouna^{2,3},
Bonfoh Bassirou², Kamanzi Kagoyire^{1,2}**

**EVALUATION OF EIGHTEEN WEST AFRICAN PLANTS
FOR WATER PURIFICATION, POTENTIAL USE FOR RURAL
WATER TREATMENT**

**¹UFR Biosciences, Université Félix Houphouët Boigny,
Abidjan, Côte d'Ivoire;**

**²Centre Suisse de Recherches Scientifiques en Côte d'Ivoire,
Abidjan, Côte d'Ivoire;**

**³UFR Sciences de la Nature, Université Nangui Abrogoua,
Abidjan, Côte d'Ivoire
mamidou.kone@csrs.ci**

The current study evaluated the effectiveness of 18 West African plants for water purification. Water samples from 18 sites were collected in six villages in the Guiglo and Mankono regions of Côte d'Ivoire and analyzed for their potability according to WHO standards. Turbid water samples were treated by coagulation flocculation and sedimentation, with 18 plant extracts as coagulants, at concentrations of 200 mg·L⁻¹. *Moringa oleifera* and chlorination were used as controls. Of the 18 water samples analyzed, three from hydraulic pumps were safe for drinking. For the 15 remaining samples (100 - 150 NTU), turbidity was reduced by 92% using *Panda oleosa*, *Euadenia trifoliolata*, *Raphia hookeri*, *Napoleonaea vogelii*, *Piper guineense* and *Uapaca heudelotii*. These plant-based coagulants showed similar performances as controls. *R. hookeri* and *E. trifoliolata* had reduction effects on iron and color of high colored water. These plants contained proteins, polysaccharides and tannins. Our findings show that plant-based coagulants, used in West Africa, may be applied to treat contaminated surface water to improve their quality for safe human drinking.

Keywords: coagulants, drinking water, plants, purification, West Africa.

Introduction

Water is essential for life and used for various activities in life, such as agriculture, cooking and washing. It remains an invaluable resource for the integration of economic, social and environmental concerns and a natural

© Kpan Wokapeu Blaise, Koné Mamidou Witabouna, Bonfoh Bassirou, Kamanzi Kagoyire, 2017

- [36] WHO. Directives of quality for the drink water. - [3rd ed]. - Geneva, 2004.
- [37] Diehl M.S., Kamanzi Atindehou K., Tere H., Betschart B. // J. Ethnopharmacol. - 2004. - 95. - P. 277 - 284.
- [38] Koné M.W., Kamanzi Atindehou K. // Pharm. Méd. Trad. Afr. - 2006. - 14. - P. 55 - 72.
- [39] Akah P.A., Aguwa C.N.R., Agu R.U. // Phytother. LMBO. - 1999. - 13. - P. 292 - 295.
- [40] Ngono Ngane A., Biyiti L., Bouchet P.H. et al. // Fitoterapia. - 2003. - 74. - P. 464 - 468.
- [41] Agyare C., Mensah A.Y., Osei Asante S. // Boletin Latinoamer. y del Caribe de Plantas Med. y Aromaticas. - 2006. - 6. - P. 113 - 117.
- [42] Christian A. // Int. J. Food Safety. - 2008. - 10. - P. 77 - 80.
- [43] Pritchard M., Craven T., Mkandawire T. et al. // Phys. Chem. Earth, A, B, C. - 2010. - 35. - P. 798 - 805.
- [44] Beltrán-Heredia J., Sánchez-Martín J., Dávila-Acedo M. // J. Hazard. Mater. - 2011. - 186. - P. 1704 - 1712.
- [45] Sánchez-Martín J., Beltrán-Heredia J., Solera-Hernández C.J. // Environ. Manage. - 2010. - 91. - P. 2051 - 2058.

Received 16.04.2014