Project Update: April 2023

Activities

1. Collect the information on its 'usage and exploitation.
2. Deposit plant samples/specimens in the herbarium of the University of Lomé
3. Evaluating the local vulnerability of useful plants by assessing their use-value indices.
4. Toxicology of drug recipes.
5. To raise the awareness on conservation.

Methodology

- **Knowledge about TMP**

The collected data are inputted and encoded in the R software for analysis. The "Ethnobotanydata" package was used to generate the basic quantitative indices in ethnobotany (Table 1). These are the reported uses (UR), the index of cultural importance (IC), and the consensus factor index (CFI).

Table 1: Indices used to describe medicinal plant knowledge.

Calculated index	Method	Interpretation
Reported uses (RU) $URS = \sum_{u=u1}^{uNC} \sum_{i=i1}^{iN} URui$	Calculates the total uses for the species by all informants (from i_1 to iN) within each use-category for that species (i)	Calculates the cultural importance index (CI) for each TMP among ethnocultural group prospected
Cultural Importance Index (CI) $\boldsymbol{IC = Na/NT}$	Na, number of people who cited the medicinal plant for a given disease divided by NT, the number of people who cited the plant	Nur, the number of times a disease category was mentioned; and Nt, the number of PMTs used in the treatment of that disease category
Consensus Factor Index (CFI) $\boldsymbol{CFI = \frac{(Nur - Nt)}{}(Nur - 1)}$	Nur, the number of times a disease category was mentioned; and Nt, the number of PMTs used in the treatment of that disease category	This index makes it possible to evaluate the degree of homogeneity of the information received from the respondents

The threatened status of the TMPs identified was assessed by comparing the IUCN Red List (IUCN, 2017) and local red lists from several authors [19,50,51]. Indeed, the red list allows us to know the risk of extinction of species, and to monitor changes in the status of species [52,53]. The classes defined are Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), and Least Concern (LC) [54]. According to the latest categorizsation, species considered

threatened include those that are critically endangered, endangered, and vulnerable. The R software, via its "Redlist" package, was used to establish the status of the TMPs identified. In addition, the GBIF database was used to complete the status of the TMPs recorded. This database provides regularly updated data and helps to better understand the level of threat to plants at the global level.

- **Toxicology of drug recipes**

To guarantee the safety of people using TMPs, general literature review was done on several search engines in order to check the truthfulness of the therapeutic indications recorded as well as the toxicological potentialities of TMP. It consisted of a review of all the biological activities of these medicinal plants, tested in vivo in the laboratory on subjects such as rats, shrimp, etc. This research was done on 25 TMPs (the most cited and common among different ethnocultural groups) across the study area.

Results

- **Knowledge about TMP**

Semi-structured interviews with resellers, occasional users, and traditional healers helped to identify 124 TMPs belonging to 118 genera and 47 families (Table 2). Our results reinforce those of Gadikou et al. (2022) working on vulnerable medicinal plants in the maritime region of Togo. Seventy-eight species are similar between the two studies. Seven TMPs are involved in the treatment of more than five diseases. These plants, qualified as versatile, offer a wide range of recipes for the treatment of diseases. They are: *A. hispidum, A. floribunda, C. bonduc, Jatropha curcas, K. senegalensis, M. lucida,* and *Vitex doniana*.

- **Toxicology of drug recipes from TMP**

The biological activities of the top 25 TMPs are summarised in table 3. All the listed plants have been studied to know their chemical composition and pharmacological properties. It appears that TMPs are sources of alkaloids, glycosides, flavonoids, tannins, terpenoids, and saponins. These different compounds give the plants their pharmacological properties. TMPs are tested for antimicrobial (six TMP), anti-inflammatory (five TMP), analgesic (five TMP), antimalarial (three TMP), antibacterial (three TMP), antifungal (three TMP), antioxidant (three TMP), antidiarrheal (two TMP), and other properties have been demonstrated in vitro. The biological properties presented by the plant extracts give credit to their indigenous uses. However, 12 plants have not been studied (according to the bibliographic research carried out) to show the safety and toxicity of TMPs (*A. hispidum, A. floribunda, A. albida, C. bonduc, C. viscosa, D. mespiliformis, J. curcas, L. taraxacifolia, M. lucida, N. latifolia, P. foetida,* and *X. aethiopica*). There is a need to study the toxicity of these plants to ensure safe and effective use in populations.

Table 2: Species of TMP with information on their families, plants parts and medicinal use, ecological zone, ethnobotanical indices (URs, CI, and CFI), local names, and IUCN status
EZ: Ecological Zone

Species / Family / Voucher number	Medicinal use TMP	Plant parts	Preparation method	EZ	URs	CI	CFI	Local name	Status IUCN
1. *Acacia dudgeoni* Craib. / ex-Holl / Fabaceae TOGO04777	diarrhea baby's tummy ache constipation snake bite	bark leaves root	decoction trituration	I, II	27	0,081	0,143		LC
2. *Acanthospermum hispidum* DC. / Compositae TOGO00750	abscesses wounds hematoma hypertension jaundice anemia headache scorpion bite malaria typhoid fever measles sinusitis	leaves whole plant	decoction maceration trituration	I, II, III, IV, V	55	0,164	0,429	Lan gbanisoè/Ka	NE
3. *Adansonia digitata* L. / Bombacaceae TOGO02476	anemia	root	decoction	I, II, III, V	4	0,012	0,071	Adzidotsi/Ew	NE
4. *Afraegle paniculata* (Schumach. & Thonn.) Engl. / Rutaceae TOGO08039	intestinal wounds	root	food	I, III, V	9	0,027	0,071	Ngoné/Ka	NE

5. Aframomum melegueta roscoe K. Schum / Zingiberaceae	abdominal wounds intestinal wounds vomiting	fruit grain	maceration	I, IV, V	26	0,078	0,214	Colombo/Ka	NE
6. *Afzelia africana* Pers. / Fabaceae TOGO00010	whooping cough sexual impotence	root	decoction	I, II, III, V	7	0,021	0,143	Wéré/Ka	VU
7. *Albizia adianthifolia* (Schumach.) W.Wight / Fabaceae TOGO04852	asthma stomach ache	leaves	decoction maceration	III, IV, V	14	0,042	0,143	Ziwa/Adj	LC
8. *Alchornea cordifolia* (Schumach. & Thonn.) Müll.Arg. / Euphorbiaceae TOGO03007	wounds constipation	root	decoction	II, III, IV, V	2	0,006	0,071	Zowou/Ka	LC
9. *Alchornea floribunda* Mülll.Arg. / Euphorbiaceae TOGO03029	colic dysentery toothache respiratory problems urinary problems ulcers	leaves root stem	decoction	IV	32	0,096	0,214	Ayraba/Ew	LC
10. *Allophylus africanus* P.Beauv. / Sapindaceae	migraine wounds	leaves	maceration trituration	I, II, III, IV, V	11	0,033	0,143	Assiviaton/Mi	LC
11. *Aloe buettneri* A.Berger / Liliaceae TOGO11614	stomach ache (lombril)	sap	leaves juice	I, II, IV	3	0,009	0,071	Aloes/Ew	NE

12. *Alstonia boonei* De Wild. / Apocynaceae TOGO02007	abdominal wounds malaria	bark	decoction	IV	43	0,128	0,143	Nyamidua/Ew	LC
13. *Annona muricata* L. / Annonaceae	fitness diabetes cancer blood pressure	leaves grain	decoction	I, II, III, IV, V	11	0,033	0,214	Agnigli/Ew	LC
14. *Anogeissus leiocarpa* (DC.) Guill. & Perr. / Combretaceae	sexual weakness mental disorder malaria	bark leaves	decoction	I, II, III, IV, V	10	0,03	0,143	Tchininga/Te	LC
15. *Anthocleista djalonensis* A. Chev. / Loganiaceae /TOGO12709	cough hernia aphrodisiac intestinal wounds	leaves root stem	decoction trituration	I, II	26	0,078	0,286	Gboloba/Ew	LC
16. *Anthocleista nobilis* G.Don / Loganiaceae	headaches wounds	bark root	decoction trituration	IV	14	0,042	0,143	Gboloba/Ew	LC
17. *Anthocleista vogelii* Planch. / Loganiaceae	epilepsy	root	decoction	IV	13	0,039	0,143	Gboloba/Ew	LC
18. *Aristolochia albida* Duch. / Aristolochiaceae TOGO02200	snake bite	leaves	maceration	II, III	35	0,104	0,071	Gadagali/Ew	NE
19. *Bidens pilosa* L. / Compositae TOGO00831	snake bite	leaves	cataplasm	II, IV, V	7	0,021	0,071	Dzanyipipi/Ew	NE

20. *Blighia sapida* K.D.Koenig / Sapindaceae TOGO08092	good shape guinea worm athlete's foot	bark leaves	maceration	II, III, IV, V	12	0,036	0,143	Kpizou/Ka	LC
21. *Boerhavia diffusa* L. / Nyctaginaceae	smallpox	root	maceration	I, III, V	2	0,006	0,143	Avhaxasa/Ew	NE
22. *Borassus aethiopum* Mart. / Arecaceae	sore throat cold	root	decoction	I, II, III, V	13	0,039	0,071	Agoti/Ew	LC
23. *Bridelia ferruginea* Benth. / Euphorbiaceae TOGO03066	dysentery lack of stool internal sores deworming	bark leaves root	decoction	I, II, III, IV, V	57	0,17	0,214	Akamati/Ew	LC
24. *Burkea africana* Hook. / Fabaceae TOGO00091	epilepsy toothache	root stem	decoction	I, II, III, IV	24	0,072	0,143	Tchingli/Ka	LC
25. *Caesalpinia bonduc* (L.) Roxb. / Fabaceae TOGO00151	diuretic headache stomach ache malaria wounds cough vomiting	leaves grain seed root	decoction piler	III, V	67	0,2	0,5	Adikou/Ew	NE
26. *Cardiospermum halicacabum* L. / Sapindaceae TOGO08110	antiviral	leaves	decoction torrefaction trituration	III, V	1	0,003	0,071	Gbatogbato/Ew	LC
27. *Carissa edulis* (Forssk.) Vahl / Apocynaceae	sexual impotence	root stem	decoction	II, III, V	9	0,027	0,071	Boetso/Ew	LC

28. *Cassia alata* L. / Fabaceae	dermatosis	leaves	decoction maceration	I, II, III, IV, V	8	0,024	0,071	Madonsohomè /Ew	LC
29. *Catharanthus roseus* (L.) G.Don / Apocynaceae TOGO02060	dysmenorrhea tension	flower root	decoction	I, II, III, IV, V	11	0,033	0,143	Flawavigbé/Ew	NE
30. *Ceiba pentandra* (L.) Gaertn. / Bombacaceae TOGO02484	fracture wounds	leaves	maceration	I, II, III, IV, V	12	0,036	0,143	Komoulé/Ag	LC
31. *Chenopodium ambrosioides* L. / Chenopodiaceae	dermatosis edema chicken pox	bark leaves stem	decoction maceration	III, IV, V	16	0,048	0,143	Emigbe/Ew	NE
32. *Chrysobalanus icaco* L. / Chrysobalanaceae TOGO00410	laxative	grain seed	trituration	V	3	0,009	0,071		NE
33. *Cissus populnea* Guill. & Perr. / Vitaceae TOGO09398	edema wounds	leaves root	decoction maceration	I, II, III, IV, V	14	0,042	0,143	Mènè/Ka	NE
34. *Clausena anisata* (Willd.) Hook.f. ex Benth. / Rutaceae TOGO08022	aphrodisiac measles	root stem	torrefaction	II, IV, V	5	0,015	0,143	Idenugbata/ Akp	LC
35. *Cleome viscosa* L. / Capparaceae	fever hemorrhoid earache malaria	leaves	decoction	I, II, V	34	0,101	0,214	Pepelugbe/Ew	NE

36. *Cnestis ferruginea* DC. / Connaraceae TOGO12608	snake bite	root	decoction maceration	II, III, IV, V	4	0,012	0,071	Tsoade/Ew	NE
37. *Cola gigantea* / Sterculiaceae / TOGO08588	against stuttering leprosy	leaves	decoction	II, III, V	7	0,021	0,143		LC
38. *Cola nitida* (Vent.) Schott & Endl. / Sterculiaceae TOGO08612	incurable wounds	leaves	infusion maceration trituration	III, IV	4	0,012	0,071	Coroo/Te	LC
39. *Combretum micranthum* G.Don / Combretaceae / TOGO00583	fever	leaves	decoction	II, III, IV, V	4	0,012	0,071	Bessikaku/Ew	LC
40. *Conyza aegyptiaca* (L.) Dryand ex. Aiton / Poaceae	dartre	leaves	maceration dew water in the leaves	I, II, III, IV, V	9	0,027	0,071		NE
41. *Costus spectabilis* (Fenzl) K.Schum. / Zingiberaceae / TOGO11932	malaria	leaves	powder	II, III	8	0,024	0,071	Tetegugu/Ew	NE
42. *Crateva adansonii* DC. / Capparaceae / TOGO00329	icterus sterility	leaves	maceration	I, II, III, IV, V	5	0,015	0,143	Watayizan/Ew	LC
43. *Curcuma longa* L. / Zingiberaceae	malaria	root	maceration	I, II, III, IV, V	7	0,021	0,071	Wissikoyè/Ka	DD

44. *Dichrostachys cinerea* (L.) Wight & Arn. / Fabaceae TOGO04914	snake bite measles	root stem	trituration	II, III, V	9	0,027	0,143	Sozossi/Te	LC
45. *Diospyros mespiliformis* Hochst. ex A.DC. / Ebenaceae TOGO02930	dermatosis headaches stomach aches female infertility	bark leaves root	decoction	I, II, III, V	34	0,101	0,214	Tigbado/Te	LC
46. *Entandrophragma angolense* (Welw.) C.DC. / Meliaceae	malaria	bark	decoction	IV	3	0,009	0,071		NT
47. *Erythrina senegalensis* DC. / Fabaceae TOGO06110	aphrodisiac dysuria	root stem	decoction	I, II, III, IV, V	22	0,066	0,143	Gbengben tchikoloka/Te	LC
48. *Euphorbia hirta* L. / Euphorbiaceae TOGO03191	cold tension	leaves	decoction infusion maceration	I, II, III, IV, V	13	0,039	0,143	Notsigbe/Ew	NE
49. *Euphorbia poissonii* Pax / Euphorbiaceae TOGO03242	constipation	leaves	decoction	II, III	7	0,021	0,071	Adikpui/Ew	NE
50. *Flacourtia flavescens* Willd. / Flacourtiaceae	dermatitis diarrhea	leaves	cataplasm decoction	III, V	13	0,039	0,143	Dêgogo/Ew	NE
51. *Garcinia afzelii* Engl. / Guttiferae TOGO03896	sexual impotence	root	decoction	IV	2	0,006	0,071		VU

52. *Garcinia kola* Heckel / Guttiferae	sexual impotence snake bite shingles	fruit grain seed	decoction	IV	15	0,045	0,214	Ahowe/Ew	VU
53. *Gliricidia sepium* (Jacq.) Walp. / Fabaceae TOGO06128	fever malaria	leaves	torrefaction	I, II, III, IV, V	1	0,003	0,071		NE
54. *Harrisonia abyssinica* Oliv. / Simaroubaceae TOGO08461	diabetes wounds	leaves	decoction	III, V	12	0,036	0,143	Xedza/Ew	LC
55. *Heliotropium indicum* L. / Boraginaceae TOGO02507	dermatitis hypertension aphthous stomatitis tension	leaves flower fruit whole plant stem	decoction	III, IV, V	31	0,093	0,286	Koklotadoe/Ew	NE
56. *Holarrhena floribunda* (G.Don) T.Durand & Schinz / Apocynaceae TOGO02075	diarrhea fever sexual impotence	bark leaves root	decoction	I, II, III, IV, V	10	0,03	0,214	Sesewu/Ew	LC
57. *Imperata cylindrica* (L.) Raeusch. / Poaceae / TOGO11004	good shape	root	decoction trituration	I, II, III, IV, V	4	0,012	0,071	Bedje/Ew	NE
58. *Jatropha curcas* L. / Euphorbiaceae	diabetes malaria wounds female sterility tetanus cough	leaves root sap stem	decoction maceration	I, II, III, IV, V	40	0,119	0,429	Babatihé/Ew	LC

59. *Jatropha gossypiifolia* L. / Euphorbiaceae	sexual asthenia fever sores malaria	leaves stem	decoction	I, II, III, IV, V	13	0,039	0,214	Babatidjin/Ew	LC
60. *Jatropha multifida* L. / Euphorbiaceae	wounds	leaves	decoction	I, II, III, IV, V	4	0,012	0,071	Têtwima/Ew	NE
61. *Kalanchoe crenata* (Andrews) Haw. / Crassulaceae TOGO02767	epilepsy vomiting	n/a	decoction maceration	IV	24	0,072	0,214	Aflatogan/Ew	NE
62. *Khaya anthotheca* (Welw.) C.DC. / Meliaceae	antiseptic	stem	decoction	IV	1	0,003	0,071	Mahogen/Ew	VU
63. *Khaya grandifoliola* C. DC. / Meliaceae	anemia malaria abdominal pain	bark	trituration	II, IV	29	0,087	0,143	Mahogen/Ew	VU
64. *Khaya senegalensis* (Desv.) A.Juss. / Meliaceae TOGO04673	amenia anthelmintic hemorrhoid headache edema malaria abdominal and intestinal wounds		decoction maceration trituration	I, II, III	170	0,507	0,429	Mahogen/Ew	VU
65. *Kigelia africana* (Lam.) Benth. / Bignoniaceae TOGO02441	abdominal wounds	bark leaves	decoction	II, III, IV, V	26	0,078	0,214	Gnakpékpé/Ew	LC

66. *Lannea acida* A.Rich. / Anacardiaceae TOGO01769	anemia	bark	decoction	I, II, III, IV, V	1	0,003	0,071	Kèlo/Te	NE
67. *Lannea barteri* (Oliv.) Engl. / Anacardiaceae TOGO01781	anemia fracture wounds	bark	decoction maceration infusion	II, III, IV, V	25	0,075	0,214	Kisan/Ka	NE
68. *Lannea kerstingii* Engl. & K.Krause / Anacardiaceae	anemia	bark	decoction infusion	I, II, IV, V	23	0,069	0,071		NE
69. *Launaea taraxacifolia* (Willd.) Amin ex C.Jeffrey / Compositae TOGO01063	dentition intestinal wounds anemia blood pressure vision problems	leaves whole plant	decoction	I, V	31	0,093	0,429	Anonto/Ew	NE
70. *Leptadenia hastata* (Pers.) Decne. / Asclepiadaceae TOGO02281	cough ulcer	whole plant root	decoction infusion	I, II, III, V	26	0,078	0,143	Sopotoriyi/Peu	NE
71. *Lippia multiflora* Moldenke / Verbenaceae TOGO09212	anemia	bark	decoction	II, IV	2	0,006	0,071	Avudatsi/Ew	NE
72. *Lonchocarpus sericeus* (Poir.) Kunth ex DC. / Fabaceae TOGO06377	headaches malaria	leaves	decoction maceration trituration	II, III, IV, V	8	0,024	0,143	Lonba/Ad	NE

73. *Mallotus oppositifolius* (Geiseler) Müll.Arg. / Euphorbiaceae TOGO03331	headaches	leaves	decoction maceration	I, II, III, IV, V	4	0,012	0,071	Nyativi/Ew	LC
74. *Markhamia lutea* (Benth.) K.Schum. / Bignoniaceae	scabies	leaves	decoction maceration	II	8	0,024	0,071		LC
75. *Mezoneuron benthamianum* Baill. / Fabaceae	antiseptic sexual impotence	leaves stem	maceration	III, IV, V	11	0,033	0,143	Gbigbova/Ew	NE
76. *Milicia excelsa* (Welw.) C.C.Berg / Moraceae TOGO05228	treatment of madness edema malaria female sterility	bark leaves	decoction	II, IV, V	28	0,084	0,286	Odoum/Akp	NT
77. *Monodora myristica* (Gaertn.) Dunal / Annonaceae TOGO12676	sores sexual weakness stomach ache	fruit	trituration	II, IV, V	10	0,03	0,143	Asioti/Mi	LC
78. *Morinda lucida* Benth. / Rubiaceae TOGO07497	fever hypertension icterus stomach ache malaria taenia	leaves root	decoction maceration	I, III, IV, V	46	0,137	0,357	Dadaklalan/Ew	LC
79. *Nauclea latifolia* Sm. / Rubiaceae TOGO07534	malaria stomachache abdominal and intestinal wounds	bark leaves root	decoction	I, II, III, IV, V	104	0,31	0,357	Nyimon/Ew	LC

80. *Newbouldia laevis* (P.Beauv.) Seem. / Bignoniaceae TOGO02452	malaria wounds	leaves	decoction maceration trituration	II, IV, V	27	0,081	0,214	Kpatima/Ew	NE
81. *Ocimum americanum* L. / Labiatae TOGO04198	fever headache malaria panariasis	leaves stem	decoction infusion maceration	I, II, III, IV, V	31	0,093	0,214	Defetsui/Ew	NE
82. *Ocimum basilicum* L. / Labiatae TOGO04188	stomach ache	leaves	decoction maceration trituration	I, II, III, IV, V	9	0,027	0,071	Esrou/Ew	NE
83. *Ocimum canum* (D. C.) / Labiatae	stomachache wound	leaves	decoction maceration	I, II, III, IV, V	4	0,012	0,071	Aswoeloo/Ka	LC
84. *Ocimum gratissimum* L. / Labiatae TOGO04218	constipation diarrhea stomachache sores	leaves	decoction maceration	IV, V	27	0,081	0,214	Hetchagni/Ag	NE
85. *Opilia amentacea* Roxb. / Opiliaceae TOGO05527	malaria fatigue	leaves	crush	I, II, III, V	8	0,024	0,071	Kalibinou/Ka	NE
86. *Parinari excelsa* Sabine / Chrysobalanaceae TOGO00444	diarrhea	stem	decoction maceration	IV	9	0,027	0,071	Kura/Peu	LC
87. *Parkia biglobosa* (Jacq.) G.Don / Fabaceae TOGO04953	abdominal wounds malaria	bark	decoction trituration	I, II, III, IV, V	17	0,051	0,071	Wotsi/Ew	NE

88. *Passiflora foetida* L. / Passifloraceae TOGO06819	anemia malaria	leaves	decoction	I, IV, V	30	0,09	0,214	Gbanto gbantwe/Adj	NE
89. *Pergularia daemia* (Forssk.) Chiov. / Asclepiadaceae TOGO02312	vertigo	leaves	decoction	I, II, IV, V	1	0,003	0,071	Halbodo/Ka	LC
90. *Phyllanthus amarus* Schumach. & Thonn. / Euphorbiaceae TOGO03374	hip and stomach pain malaria	leaves fruit whole plant root	decoction	I, II, III, V	38	0,113	0,286	Hlinvi/Ew	NE
91. *Piliostigma thonningii* (Schumach.) Milne-Redh. / Fabaceae	bleeding stomachache malaria body wounds	leaves whole plant	maceration	I, II, III, IV, V	19	0,057	0,286	Boboou/Ka	NE
92. *Piper guineense* Schum. & Thonn. / Piperaceae TOGO06863	stomachache abdominal wounds antibiotics wounds	fruit root	decoction maceration	IV	17	0,051	0,143	Kouleboe/Aké	LC
93. *Piper nigrum* L. / Piperaceae	wounds sexual weakness	fruit root	decoction maceration	IV	4	0,012	0,071	Akposso/Adj	
94. *Portulaca oleracea* L. / Portulacaceae TOGO06969	dermatosis snake bite	leaves stem	decoction crush and put in sauce	I, II, IV, V	9	0,027	0,143	Ebouatcho/ Akp	LC
95. *Prosopis africana* (Guill. & Perr.) Taub. / Fabaceae TOGO04974	tooth decay dermatosis hemorrhoids	bark leaves	decoction	I, II, III	16	0,048	0,214	Balo/Ka	LC

96. *Psidium guajava* L. / Myrtaceae	diarrhea laxative	root stem	decoction maceration	I, II, III, IV, V	21	0,063	0,071	Alelo/La	NE
97. *Pteleopsis suberosa* Engl. & Diels / Combretaceae	intestinal wounds skin wounds	leaves	decoction	II	3	0,009	0,071	Kizisina/Ka	LC
98. *Pterocarpus erinaceus* Poir. / Fabaceae TOGO06460	dysentery sexual impotence deworming	bark leaves root	decoction maceration	I, II, III	21	0,063	0,143	Ntem/Ka	EN
99. *Pterocarpus santalinoides* L'Hér. ex DC. / Fabaceae TOGO06475	dysentery	leaves	decoction	III, V	3	0,009	0,071	Kpesna/Mb	LC
100. *Pupalia lappacea* (L.) Juss. / Amaranthaceae TOGO01762	wounds	leaves	decoction	III, V	4	0,012	0,071	Tetemalima/Ew	LC
101. *Raphia vinifera* P.Beauv. / Arecaceae	wounds	leaves	decoction	III, V	4	0,012	0,071	Alati/Ew	LC
102. *Rauvolfia vomitoria* Afzel. / Apocynaceae TOGO02117	aphrodisiac hemorrhoids malaria	leaves root	decoction	III, IV, V	13	0,039	0,214	Dodema-kpowoè/Ew	LC
103. *Securidaca longipedunculata* Fresen. / Polygalaceae TOGO06932	snake bite sinusitis head wounds	leaves root	decoction	I, II, III, IV, V	34	0,101	0,143	Tritou/Ew	NE
104. *Securinega virosa* (Roxb. ex Willd.) Baill. / Euphorbiaceae	malaria headaches and stomach aches	leaves whole plant root	decoction	III, V	68	0,203	0,357	Hesre/Ew	LC

105. *Sida acuta* Burm.fil. / Malvaceae TOGO04448	complication of childbirth	leaves	decoction	I, II, III, V	20	0,06	0,071	Afidémè/Adj	NE
106. *Spathodea campanulata* P.Beauv. / Bignoniaceae TOGO02454	wounds infertility anemia malaria	bark	to chew cataplasm maceration powder	III, IV, V	20	0,06	0,143	Adatsigolo/Ew	LC
107. *Spondias mombin* L. / Anacardiaceae TOGO01852	candidiasis leprosy postpartum bleeding spasm	leaves root	decoction	I, II, III, IV, V	22	0,066	0,286	Akikonti/Ew	LC
108. *Strophanthus hispidus* A.DC. / Apocynaceae TOGO02130	malaria skin wounds	leaves	maceration	I, III, IV, V	16	0,048	0,143	Pitombayi/Ew	LC
109. *Tapinanthus bangwensis* (Engl. & Krause) Danser / Loranthaceae	cough	leaves root	decoction	II, III, IV, V	12	0,036	0,143	Gui/Ew	NE
110. *Terminalia superba* Engl. & Diels / Combretaceae TOGO00741	anemia vomiting	bark	maceration	IV	2	0,006	0,071	Donko/Ew	NE
111. Tetrapleura tetraptera (Schum. & Thonn.) Taub. / Fabaceae TOGO04983	abscess gonorrhea ulcer	leaves root	decoction maceration	III, IV	15	0,045	0,286	Ledza/Ew	LC

112. *Thevetia peruviana* (Pers.) K. Schum. / Apocynaceae	abscess gonorrhea ulcer	leaves root sap	infusion decoction	I, II, III, IV, V	12	0,036	0,214	Thevetia/Ew	LC
113. *Triplochiton scleroxylon* K.Schum. / Sterculiaceae TOGO08670	wounds	bark	decoction	III, IV	9	0,027	0,071	Atiyhe/Ew	LC
114. *Uvaria chamae* P.Beauv. / Annonaceae TOGO01952	anemia difficulty giving birth wounds female sterility cough	leaves root	decoction maceration	II, III, V	52	0,155	0,286	Agbana/Ew	LC
115. *Vernonia amygdalina* Del. / Compositae	stomachache malaria abdominal sores	leaves	decoction	I, IV, V	8	0,024	0,214	Aloma/Ew	NE
116. *Vernonia cinerea* (L.) Less. / Compositae	fever toothache female sterility	leaves stem	trituration	I, II, IV, V	12	0,036	0,143	Hunsikonou/Ad	NE
117. *Vitellaria paradoxa* subsp. paradoxa / Sapotaceae TOGO08241	icterus sexual impotence headaches sores colds	almond bark leaves latex	decoction trituration	I, II, III, IV, V	29	0,087	0,286	Yokuti/Ew	VU
118. *Vitex doniana* Sweet / Verbenaceae TOGO09278	diuretic frigidity icterus body wounds liver problems strengthens teeth	bark leaves root	food decoction trituration	I, II, III, IV, V	27	0,081	0,357	Otitikpe/Aké	NE

119. *Ximenia americana* L. / Olacaceae TOGO05429	diarrhea eczema	leaves	decoction	I, V	19	0,057	0,143	Roumouloung/ Na	LC
120. *Xylopia aethiopica* (Dunal) A.Rich. / Annonaceae TOGO01985	dysmenorrhea fever malaria sexual weakness	leaves fruit root stem	food decoction maceration trituration	I, II, III, IV, V	41	0,122	0,286	Etso/Ew	LC
121. *Zanthoxylum leprieurii* Guill. & Perr. / Rutaceae TOGO08043	abdominal wounds	bark	decoction maceration	IV	5	0,015	0,071	Xéti/Ew	NE
122. *Zanthoxylum macrophylla* (L.) Sarg. / Rutaceae	stomach ache abdominal pain malaria	bark	decoction trituration	IV	16	0,048	0,048	Xéti/Ew	NE
123. *Zanthoxylum zanthoxyloides* (Lam.) Zepern. & Timler / Rutaceae TOGO08055	aphrodisiac post-delivery wounds internal wounds for nursing mothers malaria	bark leaves whole plant root	decoction dry and crush	I, III, V	74	0,221	0,5	Xéti/Ew	LC

Ad : Adja ; **Ag** : Agnanga ; **Aké** : Akébou ; **Akp** : Akposso ; **Ew** : Ewé ; **Ka** : Kabyè ; **La** : Lamba ; **Mb** : Moba ; **Mi** : Mina ; **Na :** Nawdba ; **Peu** : Peulh; **Te** : Tem

Table 3: Summary of major chemical component, pharmacology and toxicological proprieties on top 25 TMP

TMP	Major Chemical component	Pharmacological proprieties	toxicology proprieties
Acanthosperm um hispidum	carbohydrate, alkaloids, glycosides, flavonoids, tannins, terpenoids and saponins	antimicrobial, antifungal, antiviral, anthelmintic, immunomodulatory, abortifacient, antitrypanosomally and anti-leshmanial activities	no toxicity according to the literature consulted
Alchornea floribunda	leaves have triterpenes, sterols and saponins while the stem bark had alkaloids, triterpenes, polyphenols and saponins	leaves have anti-inflammatory, antimicrobial, antioxidant and anticancer activities, while its roots and stem possess antibacterial activities	no toxicity according to the literature consulted
Alstonia boonei	alkaloids, tannins, iridoids (boonein and loganin), and triterpenoids	ant plasmodial, anti-inflammatory, analgesic, aphrodisiac, trypanocide, anti-snake venom, antidiarrhoeal, abortifacient, astringent, immunostimulant activities	in sufficient high doses, it can harm human
Aristolochia albida	aristolochic acids and esters, aristo lactams, aporphines, protoberberines, isoquinolines, benzylisoquinolines, amides, flavonoids, lignans, biphenyl ethers, coumarins, tetralones, terpenoids, benzenoids, steroids	ant plasmodial, antifeedant, prophylactic, antimalaria activities	no toxicity according to the literature consulted
Bridelia ferruginea	flavonoids, alkaloids, tannins and cardiac glycosides, anthraquinone, phlobatannins, and saponins in leaves and barks	ant plasmodial, antidiarrheal, ulcer- protective, antimicrobial, anti-neuroinflammatory, and hypoglycemic activities	dangerous at high doses

Caesalpinia bonduc	alkaloids, flavonoids, glycosides, saponins, tannins and triterpenoids	antioxidant, adaptogenic (seed), antidiabetic (seed), anti-inflammatory, anthelmintic, anti-filarial, antimicrobial, antiestrogenic, antimalarial, antiproliferative, ant psoriatic, hypoglycemic activities	no toxicity according to the literature consulted
Cleome viscosa	viscose and viscosin (seed); coumarino- lignoid	anthelmintic, antimicrobial, analgesic, anti-inflammatory, immunomodulatory, antipyretic, psycho-pharmacological, antidiarrheal, and hepatoprotective activities	no toxicity according to the literature consulted
Diospyros mespiliformis	naphtoquinones, acide bétulique, sitosterol's, saponines, triterpènes, tanins.	antibacterial, astringent, anti-spasmodic, and anti-inflammatory activities	no toxicity according to the literature consulted
Heliotropium indicum	pyrrolizidine alkaloids	antimicrobial, antitumor, antituberculosis, ant plasmodial, anticataract, antifertility, wound healing, anti-inflammatory, antinociceptive, analgesic and histo-gastro protective activities	Toxic, internal therapy is not recommended. cytotoxicity and other mutagenic and carcinogenic properties have also been reported in different studies
Jatropha curcas	alkaloids such as jatrophine, jatropham, curcacycline a, curcain, tannins, glycosides, flavonoids and sapogenins	antibacterial, antifungal, antiviral, anti-inflammatory, antioxidant, coagulant and anticoagulant activities, antidiarrhoeal, and pregnancy terminating activities	no toxicity according to the literature consulted

Khaya grandifoliola	saponins, proteins and carbohydrates (leaves and bark), while alkaloids, tannins, and anthraquinone are located only in the bark	anticancer, antidiabetic, antimicrobial, anti-sickness, antiulcerogenic, and hepatoprotective activities	bark contain cardiac glycosides which are known to be toxic
Khaya senegalensis	antimalarial, antibacterial, antifungal on botrytis cinerea, anti-inflammatory, anthelmintic	antioxidant, antihyperglycemic, hepatoprotective, anti-inflammatory, and antidiarrheal activities	no toxicity according to the literature consulted
Launaea taraxacifolia	vitamins, minerals, proteins, essential fatty acids, and flavonoids	antimalarial, antiviral against the measles virus, antioxidant, antiarthritic, anti-inflammatory and bactericidal activities	no toxicity according to the literature consulted
Milicia excelsa	ursolic acid, lupeol acetate, alkaloid, phenols, tannin, flavonoids	anticonvulsant, anti-amnesic, antipsychotic, anti-inflammatories, anti-hypoxic activities	no toxicity according to the literature consulted
Morinda lucida	alkaloids, anthraquinones and anthraquinols	treatment of malaria, febrifuge, analgesic, laxative and anti-infections, trypanocide and aortic vasorelaxant activities, anticancer, hepato protective, cytotoxic and genotoxic, anti-spermatogenic, hypoglycemia and antidiabetic activities	no toxicity according to the literature consulted
Nauclea latifolia	monoterpene, triterpene, indole alkaloid, saponins and traces of inorganic compounds in the roots	cardiovascular, spasmolytic, anti-plasmodial, antiparasitic, antinociceptive, anti-inflammatory and antipyretic activities	no toxicity according to the literature consulted

Ocimum americanum	estragole, eugénol, sesquiterpènes, flavonoïdes, composés phénoliques, saponosides, triterpènes, acide ursolique, acide oléanolique, acide benzoïque, stérols, polyphénols.	antibacterial, antidiarrheal, antifungal, healing, anesthetic, stimulant.	no toxicity according to the literature consulted
Passiflora foetida	reducing sugars, alkaloids, flavonoids, tannins, steroids, gums and glycosides	analgesic, antihyperglycemic, antidiarrhoeal, antidepressant and cytotoxic activities	no toxicity according to the literature consulted
Phyllanthus amarus	alcaloïdes (nirurine), lignanes, huile essentielle, flavonoïdes, tanins.	antihepatotoxic, diuretic, anti-inflammatory activities	no toxicity according to the literature consulted
Securidaca longipedunculata	alkaloids, cardiac glycosides, flavonoids, saponins, tannins, volatile oils, terpenoids and some steroids	antiparasitic, antioxidant, anti-plasmodial, anti-inflammatory, antibacterial, antifungal, hypoglycemia, anticonvulsant, anxiolytic and sedative, histopathologic activities	toxic at high concentrations
Flueggea virosa	saponins, tannins, glycosides, alkaloids and steroids	antimalarial, hypoglycemic effect, analgesic, antidiabetic, antioxidant, antiproliferative and cytotoxic properties and anti-inflammatory	leaves contain cytotoxic alkaloids
Uvaria chamae	cardiac glycosides, tannins, flavonoids, alkaloids free and combined anthraquinones, and cyanogenic glycosides	antioxidative, antimitotic, and DNA-damaging activities, antimalarial, antibacterial, antidiabetic, hypoglycemic activities	no toxicity according to the literature consulted

Vitellaria paradoxa	glycerid of saturated and unsaturated fatty acids, triterpenic alcohols, vitamins.	anti-inflammatories, decongestion activities	no toxicity according to the literature consulted
Xylopia aethiopica	saponin, saponin glycoside, tannin, balsam, cardiac glycoside and volatile oil	antimicrobial, anti-anaphylactic, anti-inflammatory, antiproliferative, antifertility effect, hypolipidemic, antioxidant potentials, and contraceptive activities	no toxicity according to the literature consulted
Zanthoxylum zanthoxyloides	terpenoids, alkaloids (benzophenanthridines, furoquinolines, aporphines), romatic and aliphatic amides, coumarins and lignans	antifungal, antibacterial, anti-trypanosomal, hepatocellular, gastroprotective, cytotoxic activities	metabolic extract of root bark has been found to be safe

- **Awareness of Result**

We produce a book on vulgarization among local people. On a scientific level, the results of this project were presented at the University of Lomé symposium in October 2022 (see photo below – Attestation of participation and attestation of communication).

Attestation of participation

9 INDUSTRIE, INNOVATION ET INFRASTRUCTURE

J S I L 2022

Université de Lomé

RÉPUBLIQUE TOGOLAISE

Direction de la Recherche et de l'Innovation

Journées Scientifiques Internationales de Lomé JSIL-2022, XIXe Edition

ATTESTATION DE PARTICIPATION

Je soussigné, **Pr. TSIGBE Koffi Nutefé**, Directeur de la Recherche et de l'Innovation, atteste que

Kodjovi Mawuégnigan Léonard AGBODAN,

a participé à la XIXe édition des Journées Scientifiques Internationales de Lomé JSIL-2022 sous le thème : « *Quelles recherche scientifique et innovations dans les universités et centres de recherche africains pour l'atteinte de l'ODD 9 ?* »

Campus universitaire de Lomé, 17-21 octobre 2022

Lomé, le 20 octobre 2022

Le Directeur

Pr. TSIGBE Koffi Nutefé

AUF Hanns Seidel Stiftung PNUD Organisation des Nations Unies pour l'alimentation et l'agriculture WASCAL CERME CERSA CERVIDA BOAD CCI TOGO Port Autonome de Lomé

Attestation of communication

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RÉPUBLIQUE TOGOLAISE

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Journées Scientifiques Internationales de Lomé JSIL-2022, XIXe Edition

ATTESTATION DE COMMUNICATION

Je soussigné, **Pr. TSIGBE Koffi Nutefé**, Directeur de la Recherche et de l'Innovation, atteste que

Kodjovi Mawuégnigan Léonard AGBODAN

a pris part et a présenté une communication intitulée :

Bayesian approach and Imprecise Dirichlet Model for the selection (under/overused) of medicinal plants in the Guinean zone of Togo

à la XIXe édition des Journée Scientifiques Internationales de Lomé JSIL-2022 sous le thème :
« *Quelles recherche scientifique et innovations dans les universités et centres de recherche africains pour l'atteinte de l'ODD 9 ?* »

Campus universitaire de Lomé, du 17 au 21 octobre 2022

Lomé, le 21 octobre 2022

Le Directeur

Pr. TSIGBE Koffi Nutefé

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