

A Swedish collection of medicinal plants from Cameroon

Finn Sandberg^{a,*}, Premila Perera-Ivarsson^a, Hesham Rushdey El-Seedi^{a,b,*}

^a Division of Pharmacognosy, Department of Medicinal Chemistry, Biomedical Centre, Uppsala University, Box 574, SE-751 23 Uppsala, Sweden

^b Chemistry Department, Faculty of Science, El-Menoufia University, Shebin El-Kom, El-Menoufia, Egypt

Received 1 December 2003; received in revised form 1 June 2005; accepted 16 June 2005

Available online 10 August 2005

Abstract

A collection of 32 botanically identified medicinal plants from the slopes of Mt. Cameroon made by two Swedish settlers in the beginning of the last century is described and the literature is followed up. The drug names were found to be unaltered during the century passed. © 2005 Elsevier Ireland Ltd. All rights reserved.

Keywords: Plants; Medicinal; Cameroon

The Department of Pharmacology of the Caroline Institute (Karolinska Institute), Stockholm, Sweden, previously had a large collection of drugs. When the Institute moved in the late 1940s to new premises in Solna, space was no longer available for the large drug collection in the Department of Pharmacology. One of the authors (F.S.), active at that time at this department, participated in the packing of the drug collection in 54 wooden boxes, to be sent to the Department of Pharmacognosy of, at that time, Royal Pharmaceutical Institute in Stockholm. In addition to these boxes, there was a cupboard containing medicinal plants from Cameroon. When F.S. returned to the Royal Pharmaceutical Institute in 1954, the wooden boxes were still in the office and unpacked, and the cupboard was locked.

The cupboard (Fig. 1) with its collection of 32 botanically identified and some unidentified medicinal plants from Cameroon is the starting point for this paper (Santesson, 1926) (Table 1). This cupboard was donated in 1924 to the drug-museum in the Caroline Institute in honor of Professor Gustav von Düben, specialist on the ethnography of Africa, by two Swedish business men: Knut Knutson and Georg Waldau, one of them (G.W.) had been active for more than 40

years on the southwest slopes of Mount Cameroon. These gentlemen have also been mentioned in the polite literature by the Swedish author Per Wästberg (Wästberg, 1986, 1987).

For about one decade this cupboard was unattended in the Department of Pharmacognosy, but when one of the authors (F.S.) traveled in 1965 to Cameroon to collect African *Strychnos* species for phytochemical investigation, the interest arose to reinvestigate the drugs of the Knutson–Waldau collection.

In this paper, the 32 identified medicinal plants will be dealt with: what was known by Professor Santesson and what is known in 1993, after 80 years, when Professor Lars Bohlin and Professor Finn Sandberg made a revisit in Cameroon. The drug names were found to be unaltered during the century past. This is in agreement with our findings in other areas in Africa, among others in Central African Republic and in Congo, Brazzaville. The order of the drugs is the same as Professor Santesson has used, i.e., the plants are arranged according to plant families. It should be mentioned that the taxonomic identification of the drug samples was made mainly by Professor Robert Fries (Stockholm) and Professor J. Milbraed (Berlin, Dahlem).

New references mean all references after Professor C.G. Sanderson's original paper in 1926 (Santesson, 1926).

In the drug collection, unidentified drugs nos. 33–42 are not dealt with in this publication.

* Corresponding authors. Tel.: +46 18 38 6042; fax: +46 18 38 6042.
E-mail address: Hesham.El-Seedi@fkog.uu.se (H.R. El-Seedi).



Fig. 1. Cupboard, containing drugs from Cameroon, donated to Karolinska Institutet (Caroline Institute) by G. Valdau and K. Knutsson as a sign of thankfulness and respect to the deceased Professor Gustaf v. Düben.

Table 1
Plant Drugs (Knutson-Waldau collection) at the Division of Pharmacognosy, Biomedical Center, Uppsala, Sweden

Family	Asteraceae (Compositae)
No. 1	<i>Spilanthes acmella</i> L. Vernacular name: Sekke Plant part used: Herb (entire plant) Local use: Against snakebite and rheumatic fever (Santesson, 1926) New ref.: Larvicidal effect (Pitasawat et al., 1998); bioactive amides (Ramsewak et al., 1999); allergenic activity (Mondal et al., 1998); convulsion (Moreira et al., 1989); analgesic effect of flowers (Ansari et al., 1988); essential oil (Lemos et al., 1991); new amides (Sandberg, 1980; Greger et al., 1985; Mukharya and Ansari, 1987); actinolides (Bohlmann et al., 1985); pungent alkamides (Nagashima and Nakatani, 1992; Nakatani and Nagashima, 1992); photochemical examination (Tiwari and Kakkur, 1990); amyirin, sitosterol (Krishnaswamy et al., 1975)
No. 2	<i>Microglossa volubilis</i> D.C. Vernacular name: Bendem-bende Plant part used: Leaves Local use: Against strong cough (Santesson, 1926) New ref.: Used against sore eyes, ring worm, cataract (Dalziel, 1995); diterpenes (Zdero et al., 1990); acetylenic glucosides (Rücker et al., 1992)

Table 1 (Continued)

No. 3	Cucurbitaceae <i>Coccinia barteri</i> (Hook. f.) Keay Vernacular name: Efoto Plant part used: Leaves Local use: Against deafness New ref.: None
No. 4	Acanthaceae <i>Mimulopsis violacea</i> Lindau Vernacular name: Majamanjumbo Plant part used: Leaves Local use: Against gonorrhoea New ref.: New species (Troupin, 1982); leaf structure (Karlström, 1978)
No. 5	Latin name: Unknown Vernacular name: Esinga mokusi Plant part used: Leaves Local use: Against stomachache New ref.: No specific for Esinga mokusi
No. 6	Latin name: Unknown Vernacular name: Ebäeba Plant part use: Root bark Local use: Against ascariis New ref.: No specific for Ebäeba
No. 7	Bignoniaceae <i>Kigelia acutifolia</i> Engl. Vernacular name: Bulule Plant part used: Stem bark Local use: Against snakebite, dysentery New ref.: Santesson tested a water extract on two <i>Rana temporari</i> without any effect at all (Santesson, 1929); new coumarins (Govindachari et al., 1971); new naphtoquinone and lignan derivatives (Inoue et al., 1981; Moideen et al., 1999; Weiss et al., 2000); new terpenoid aldehydes (Joshi et al., 1982). The fruit is also used: against dysentery, as laxative; against hemorrhoids (Dalziel, 1995); antibacterial and antifungal activity (Akunyili et al., 1991; Binutu et al., 1996); activity against melanoma (Houghton et al., 1994)
No. 8	Solanaceae <i>Solanum</i> sp. Vernacular name: Etnangonga Plant part used: Root, fruit Local use: Against thorax diseases New ref.: No specific for Etangong
No. 9	Lamiaceae (Labiatae) Latin name: Unknown Vernacular name: Esamoimbar Plant part used: Leaves Local use: Against syphilis New ref.: None specific for Esamoimbar
No. 10	Verbenaceae <i>Clerodendrum silvaticum</i> Henriques Vernacular name: Mosongo songo Plant part used: Leaves Local use: Against rheumatism, snakebite, thoracic pains New ref.: No references on <i>C. silvaticum</i>
No. 10a	Melastomataceae <i>Dissotis rotundifolia</i> (Sm.) Triana Vernacular name: Njanga Plant part used: Herb (entire plant) Local use: Against severe cough New ref.: Hydrolyzable tannins (Yoshida et al., 1987);

Table 1 (Continued)

	treatment of scars given by framboesia (Dalziel, 1995); used as an antihelmintic and against diarrhea (Watt and Breyer-Brandwijk, 1962); antiviral effect (Boström, 1995); antiplasmodial effect (Omulokoli et al., 1997)
No. 11	Rhizophoraceae <i>Rhizophora mangle</i> L. Vernacular name: Elgnamefisir Plant part used: Stem bark Local use: Against leprosy, malaria, catarrh and internal bleedings, externally for treatment of wounds New ref.: Triterpenoids with insecticidal effect (Williams, 1999); antimicrobial properties (Rojas Hernandez and Coto Perez, 1978); translocation of four organochlorine compounds (Walsh et al., 1974); immunochemical studies of mangle gum (Rao et al., 1971)
No. 12	Violaceae <i>Rinorea monticola</i> M. Brandt Vernacular name: Lindu Plant part used: Leaves Local use: Against syphilis New ref.: None
No. 13	Sterculiaceae <i>Sterculia tragacantha</i> Lindl. Vernacular name: Udoto, Eugungo Plant part used: Branches of the tree Local use: Against chronic syphilis New ref.: None
No. 14	Vitaceae <i>Leea guineese</i> G. Don Vernacular name: Engälakoto Plant part used: Leaves Local use: Against stomachache New ref.: Used as an expectorant, uterine contraction, contains sterols, anthocyanins, flavonoids (Djoko et al., 1983); juice of leaves as eye drops, young leaves are rubbed on the chest against pains, and against vomiting for small children (Thomas et al., 1989)
No. 15	Rhamnaceae <i>Maesopsis eminii</i> Engl. (Syn.: <i>Karlea berchemioides</i> Pierre) Vernacular name: Esenge Plant part used: Root bark Local use: Against edema New ref.: None
No: 15a	Icacinaceae <i>Lasianthera africana</i> P. Beauv. Vernacular name: Be'lele Plant part used: Leaves Local use: Against stomach pains New ref.: None
No. 16	Anacardiaceae <i>Spondias mombin</i> L. Vernacular name: Monganga Plant part used: Leaves Local use: Against chronic syphilis New ref.: Antimicrobial (Abo et al., 1999; Rodrigues et al., 2000); wound-healing activity (Villegas et al., 1997); antibacterial and molluscicidal effect (Corthout et al., 1994); betalactamase inhibitor (Coates et al., 1994); abortifacient activity (Offiah and Anyanwu, 1989)
No. 17	Euphorbiaceae <i>Jatropha curcas</i> L.

Table 1 (Continued)

	Vernacular name: Big nut Plant part used: Leaves Local use: Against rheumatic fever New ref.: Toxic activity (Rug and Ruppel, 2000); esterase and lipase activity (Staubmann et al., 1999); nutritional studies (Makkar and Becker, 1999); disinfectant/antiparasitic activities (Fagbenro-Beyioku et al., 1998); antiviral properties (Matsuse et al., 1999); antinutrient and toxic factors in seeds (Makkar et al., 1998); in vitro evaluation (Rai, 1996); molluscicidal activity (Liu et al., 1997); abortive effect (Goonasekera et al., 1995); toxicity in chicks (Ahmed and Adam, 1979a; Joubert et al., 1984; Abdu-Aguye et al., 1986; el Badwi et al., 1995); cyclic octapeptides (van der Berg et al., 1995); cicatrization effect (Salas et al., 1994); effect on hisex chicks and calves (Ahmed and Adam, 1979b; el Badwi et al., 1992; el Badwi and Adam, 1992); carcain, protease from latex (Nath and Dutta, 1991); curcacycline A (van der Berg et al., 1995); tumor promoter (Hirota et al., 1988); gout (Adam and Magzoub, 1975); induction of mutation (Horiuchi et al., 1987; Rojanapo et al., 1987); inhibition of protein synthesis (Stirpe et al., 1976); phytochemistry (Khafagy et al., 1977); toxic effects in mice (Adam, 1974)
No. 18	<i>Alchornea cordifolia</i> (Schum. et Thonn.) Müll.-Arg. Vernacular name: Bondji (or Dibobunji) Plant part used: Leaves Local use: Against dysentery New ref.: Against gonorrhoea and framboesia (Mildbraed, 1913); against stomach pains, tooth pains and as chewing sticks; male inflorescences for treatment of wounds; for treatment of umbilical abscess (Thomas et al., 1989); used as abortive and aphrodisiac (Walker, 1952, 1953); antibacterial effects (Ogunlana and Ramstad, 1975; Lamikanra et al., 1990; Okeke et al., 1999); antiamebic and spasmolytic activities (Stirpe et al., 1976; Tona et al., 1998; Tona et al., 2000); antidiarrhoeal effect (Tona et al., 1999); alchornoic acid in seeds (Kleiman et al., 1977); quercetin and quercetin-derivatives (Ogungbamila and Samuelsson, 1990); content of tannins in leaves and bark (Bennet, 1950); isolation of alchorhein and derivatives and use as aphrodisiac, against scabies and gastrointestinal problems (Khuong-Huu et al., 1970; Goutarel and Khuong-Huu-Laine, 1972; Khuong-Huu et al., 1972); anticholinergic effect (Sandberg and Cronlund, 1982)
No. 19	<i>Spondianthus preussii</i> Engl. (Syn: <i>Megaborea trilesii</i> Pierre) Vernacular name: Bojande (Wujunde) Plant part used: Stem bark Local use: Rat poison New ref.: Pharmacological screening (Sandberg et al., 1987); a toxic plant to African cattle (Sere et al., 1982); curcubitacin (Tessier and Paris, 1974)
No. 19a	<i>Phyllanthus odontadenius</i> Müll.-Arg. Local use: For intoxication New ref.: Unusual tannin (Foo and Wong, 1992); phyllanthostatin (Pettit and Schaufelberger, 1988; Pettit et al., 1990); hydrolysable tannins (Yoshida et al., 1992) Local use: For intoxication
No. 20	Meliaceae <i>Heckeldora staudtii</i> (Harms) Staner Vernacular name: Libenge Plant part used: Root bark and branches Local use: Against abscess in the stomach New ref.: None

Table 1 (Continued)

No. 21	<i>Trichilia heudelotti</i> Planch ex Oliv. Vernacular name: Efeefe Plant part used: Fruit Local use: Against rheumatic fever New ref.: Isolation, structure of trichilins (Naktani et al., 1981); prieriunoside (Adam, 1974); anti-inflammatory effect (Nores et al., 1997; Benencia et al., 2000a,b); antiplasmodial activity (El Tahir et al., 1999); phagocytic activity (Benencia et al., 1999); limonoids (Castro et al., 1996; Gunatilaka et al., 1998); prostaglandin-synthesis inhibitor (Jager et al., 1996); against schistosomiasis (Sparg et al., 2000); antimalarial activity (Adam and Magzoub, 1975; Traore-Keita et al., 2000)
No. 22	Rubiaceae <i>Fagara macrophylla</i> Oliv. Vernacular name: Vuonge (Verongo, Veronge) Plant part used: Leaves and root bark Local use: Leaves against cardiac palpitations, and root bark against syphilis New ref.: Antitumor agents (Wall et al., 1987)
No. 23	Papilionaceae [Leguminosae] <i>Desmodium adscendens</i> D.C. Vernacular name: Tombolombo Plant part used: Leaves Local use: Against catching a cold New ref.: Smooth muscles inhibitions (Addy, 1989); effect on arachidonic acid metabolism (Addy, 1992); effects on anaphylaxis (Addy and Awaumey, 1984); effect on guinea pig airways (Addy and Burka, 1987, 1988, 1989, 1990); anaphylactic reactions (Addy and Dzandu, 1986); inhibition of oxygenation (Addy and Schwartzman, 1992); plants that heal (Ampofo, 1997); activation of potassium channels (McManus et al., 1993); effects on rodents (N'gouemo et al., 1996)
No. 24	<i>Physostigma venenosum</i> Balf. Vernacular name: Calabar-beans Plant part used: Seed Local use: Against rheumatic fever New ref.: The pure alkaloid physostigmine is used since time past in ophthalmology as an anti-acetylcholin esterase agent (Robinson and Robinson, 1968); absolute configuration (Longmore and Robinson, 1969)
No. 25	Capparidaceae <i>Cleome ciliata</i> Schum. et Thonn. Vernacular name: Lovanga Plant part used: Herb (entire plant) Local use: Against deafness New ref.: Microbiological profile (Utsalo et al., 1990)
No. 26	Annonaceae <i>Xylopia aethiopica</i> (Dun.) A. Rich Vernacular name: Alligator pepper Plant part used: Fruit with seeds Local use: Against catching cold, cardiac palpitations New ref.: Key aroma compounds (Tairu et al., 1999); composition of seeds and oil (Barminas et al., 1999); trachylobane diterpenoid (Nguela et al., 1998); isolation of bioactive alkaloids (Harrigan et al., 1994); influence on the mutagenicity of aflatoxin (Osowole et al., 1992); antimicrobial properties (Boakye-Yiadom et al., 1977)
No. 27	Menispermaceae <i>Jateorhiza strigosa</i> Miers Vernacular name: Dimone Plant part used: Leaves

Table 1 (Continued)

	Local use: Against snakebite New ref.: Pharmacological tests on frogs (Santesson, 1929)
No. 28	Amaranthaceae <i>Cyathula prostrata</i> (L.), Blume (Syn.: <i>Cyathula geniculata</i> Lour.) Vernacular name: Krokos Plant part used: Leaves and whole herb Local use: The leaves are used against rheumatic fever. The herb is used against dysentery New ref.: Against stomach pain (Thomas et al., 1989); insect metamorphosing substance (Hikino et al., 1970a,b); sengosterone (Hikino et al., 1969); insect-molting substances (Takemoto et al., 1968); arthropod molting hormone (Hikino and Takemoto, 1972); effect on protein synthesis (Otake et al., 1968)
No. 29	<i>Myrianthus arboreus</i> P. Beauv. Vernacular name: Bokekky (Wokäku) Plant part used: Leaves Local use: Against dysentery New ref.: Myrianthines A–C (Marchand et al., 1968)
No. 30	Piperaceae <i>Piper guineense</i> Schum. et Thonn. Vernacular name: Jove, Ili Plant part used: Fruit Local use: Against chronic syphilis in the throat; against rheumatism New ref.: Effect on skeletal muscle of rat and frog (Udoh et al., 1999); uterine muscle activity (Udoh, 1999); nutrient and antinutrient composition (Isong and Essien, 1996); anticonvulsant effects (Abila et al., 1993); insecticidal components (Gbewonoya and Candy, 1992); wisanine (Ayitey-Smith and Addae-Mensah, 1977); constituents (Dwuma-Badu et al., 1976); dihydrocubebin (Dwuma-Badu et al., 1975)
No. 31	Palmae <i>Raphia vinifera</i> Beauv. Vernacular name: Atat Plant part used: Fruit Local use: against leprosy together with bark of <i>Rhizophora</i> sp. In tropical West Africa it is used for wine production New ref.: None for specific medical use
No. 32	Gramineae <i>Eleusine indica</i> Gaertn Vernacular name: Esinge-Singe Plant part used: Whole herb Local use: Against hemorrhagic cough New ref.: Double mutation (Anthony and Hussey, 1999); resistant biotype (Yamamoto and Baird, 1999; Zeng and Baird, 1999); antimicrobial drug (Yamamoto et al., 1998); identification of the "A" genome (Hilu, 1988); root growth (Wong and Lau, 1985)

Acknowledgement

The authors would like to thank Mrs. Ilse Grebe for valuable help in various aspects of the manuscript. One of the authors (H.R.E.) is extremely grateful to the International Foundation for Science for a generous financial support (Grant-in-Aid F/3334-1) and to the Swedish Institute (Stockholm, Sweden) for scholarship.

References

- Abdu-Aguye, I., Sannusi, A., Alafiya-Tayo, R.A., Bhusnurmath, S.R., 1986. Acute toxicity studies with *Jatropha curcas* L. Human Toxicology 5, 269–274.
- Abila, B., Richens, A., Davies, J.A., 1993. Anticonvulsant effects of extracts of the West African black pepper. Journal of Ethnopharmacology 39, 113–117.
- Abo, K.A., Ogunleye, V.O., Ashidi, J.S., 1999. Antimicrobial potential of *Spondias mombin* and *Croton zambesicus*. Phytotherapy Research 13, 494–497.
- Adam, S.E., 1974. Toxic effects of *Jatropha curcas* L. in mice. Toxicology 2, 67–76.
- Adam, S.E., Magzoub, M., 1975. Toxicity of *Jatropha curcas* L. for goats. Toxicology 4, 247–254.
- Addy, M.E., 1989. Several chromatographically distinct fractions of *Desmodium adscendens* inhibit smooth muscle contractions. International Journal of Crude Drug Research 27, 81–91.
- Addy, M.E., 1992. Some secondary plant metabolites in *Desmodium adscendens* and their effects on arachidonic acid metabolism. Prostaglandins Leukotrienes and Essential Fatty Acids 47, 85–91.
- Addy, M.E., Awaumey, E.M.K., 1984. Effects of the extracts of *Desmodium adscendens* on anaphylaxis. Journal of Ethnopharmacology 11, 283–292.
- Addy, M.E., Burka, J.F., 1987. Dose–response effects of one sub fraction of *Desmodium adscendens* aqueous extract on antigen- and arachidonic acid-induced contractions of guinea-pig airways. Phytotherapy Research 1, 180–186.
- Addy, M.E., Burka, J.F., 1988. Effect of *Desmodium adscendens* fraction on antigen-II and arachidonic acid-induced contractions of guinea-pig airways. Canadian Journal of Physiology and Pharmacology 66, 820–825.
- Addy, M.E., Burka, J.F., 1989. Effect of *Desmodium adscendens* fraction-F1 (DAF1) on tone and agonist-induced contractions of guinea-pig airways smooth-muscle. Phytotherapy Research 3, 85–90.
- Addy, M.E., Burka, J.F., 1990. Effect of *Desmodium adscendens* fraction 3 on contractions of respiratory smooth muscle. Journal of Ethnopharmacology 29, 325–335.
- Addy, M.E., Dzandu, W.K., 1986. Dose-response effects of *Desmodium adscendens* aqueous extract on histamine response, content and anaphylactic reactions in the guinea pig. Journal of Ethnopharmacology 18, 13–20.
- Addy, M.E., Schwartzman, M.L., 1992. An extract of *Desmodium adscendens* inhibits NADPH-dependent oxygenation of arachidonic acid by kidney cortical microsomes. Phytotherapy Research 6, 245–250.
- Ahmed, O.M., Adam, S.E., 1979a. Toxicity of *Jatropha curcas* in sheep and goats. Research in Veterinary Science 27, 89–96.
- Ahmed, O.M., Adam, S.E., 1979b. Effects of *Jatropha curcas* on calves. Veterinary Pathology 16, 476–482.
- Akunyili, D.N., Houghton, P.J., Raman, A., 1991. Antimicrobial activities of the stem bark of *Kigelia pinnata*. Journal of Ethnopharmacology 35, 173–177.
- Ampofo, O., 1997. Plants that heal. World Health 9, 26–30.
- Ansari, A.H., Mukharya, D.K., Saxena, V.K., 1988. Analgesic study of *N*-isobutyl-4,5-decadienamide isolated from the flowers of *Spilanthes acmella* (Murr.). Indian Journal of Pharmaceutical Sciences 50, 106.
- Anthony, R.G., Hussey, P.J., 1999. Double mutation in *Eleusine indica* alpha-tubulin increases the resistance transgenic maize calli to dinitroaniline and phosphorothioamidate herbicide. The Plant Journal for Cell and Molecular Biology 18, 669–674.
- Ayitey-Smith, E., Addae-Mensah, I., 1977. A preliminary pharmacological study of wisanine, a piperidine type alkaloids from the roots of *Piper guineense*. West African Journal of Pharmacology and Drug Research 4, 79P–80P.
- Barminas, J.T., James, M.K., Abubakar, U.M., 1999. Chemical composition of seeds and oil of *Xylopiya aethiopia*. Plant Foods for Human Nutrition 53, 193–198.
- Benencia, F., Courreges, M.C., Coulombie, F.C., 1999. *Trichilia glabra*: effect on the phagocytic activity and respiratory burst resperitoneal macrophages. Immunopharmacology 4, 45–53.
- Benencia, F., Courreges, M.C., Coulombie, F.C., 2000a. *In vivo* and *in vitro* immunomodulatory activities of *Trichilia glabra* aqueous extracts. Journal of Ethnopharmacology 69, 199–205.
- Benencia, F., Courreges, M.C., Coulombie, F.C., 2000b. Anti-inflammatory activities of *Trichilia glabra* aqueous leaf extract. Journal of Ethnopharmacology 71, 293–300.
- Bennet, H., 1950. *Alchornea cordifolia* bark from Nigeria. Colonial Plant and Animal Products 1, 12–134.
- Binutu, O.A., Adesogan, K.E., Okogun, J.I., 1996. Antibacterial and antifungal compounds from *Kigelia pinnata*. Planta Medica 62, 352–353.
- Boakye-Yiadom, K., Biagbe, N.I., Ayim, J.S., 1977. Antimicrobial properties of some West African medicinal plants. Antifungal activity of xylopic acid and other constituents of the fruits of *Xylopiya aethiopia* (Annonaceae). Lloydia 40, 543–545.
- Bohlmann, F., Jakupovic, J., Hartono, L., King, R.M., Robinson, H., 1985. A further steiractinolide derivative from *Spilanthes leiocarpa*. Phytochemistry 24, 1100–1101.
- Boström, P., 1995. Antiviral and cytotoxic effects in medicinal plants from Cameroon. Personal communication, Uppsala University.
- Castro, O., Barrios, M., Chinchilla, M., Guerrero, O., 1996. Chemical and biological evaluation of the effect of plant extracts against *Plasmodium berghei*. Revista de Biología Tropical 44, 361–367 (Spanish).
- Coates, N.J., Gilpin, M.L., Gwynn, M.N., Lewis, D.E., Milner, P.H., Spear, S.R., Tyler, J.W., 1994. SB-202742, a novel beta-lactamase inhibitor isolated from *Spondias mombin*. Journal of Natural Products 57, 654–657.
- Corthout, J., Pieters, L., Claeys, M., Geerts, S., Van den Berghe, D., Vlietinck, A., 1994. Antibacterial and molluscicidal phenolic acids from *Spondias mombin*. Planta Medica 60, 460–463.
- Dalziel, J.M., 1995. The Useful Plants of West Tropical Africa (3rd reprint). Crown Agents for Overseas Governments and Administrations, London.
- Djoko, E., Eboutou, M.L.E., Mbenkum Fonki, T., Rafidision, P. (Eds.), 1983. Plantes Médicinales du Cameroun. Serie no.1. Centre d'Etudes des Plantes Médicinales, Yaounde.
- Dwuma-Badu, D., Ayim, J.S., Dabra, T.T., 1975. Constituents of West African medicinal Plants, IX. Dihydrocubebin, a new constituent from *Piper guineense*. Lloydia 38, 343–345.
- Dwuma-Badu, D., Ayim, J.S., Dabra, T.T., 1976. Constituents of West African medicinal plants, XIV. Constituents of *Piper guineense* Schum. and Thonn. Lloydia 39, 60–64.
- el Badwi, S.M., Adam, S.E., 1992. Toxic effects of low levels of dietary *Jatropha curcas* seed on brown hisex chicks. Veterinary and Human Toxicology 34, 112–115.
- el Badwi, S.M., Mousa, H.M., Adam, S.E., Hapke, H.J., 1992. Response of brown hisex chicks to low levels of *Jatropha curcas* L., *Ricinus communis* or their mixture. Veterinary and Human Toxicology 34, 304–306.
- el Badwi, S.M., Adam, S.E., Hapke, H.J., 1995. Comparative toxicity of *Ricinus communis* and *Jatropha curcas* L. in brown chicks. Deutsche Tierärztliche Wochenschrift 102, 75–77.
- El Tahir, A., Satti, G.M.H., Khalid, S.A., 1999. Antiplasmodial activity of selected Sudanese medicinal plants with emphasis on *Maytenus senegalensis* (Lam) Exell. Journal of Ethnopharmacology 64, 227–233.
- Fagbenro-Beyioku, A.F., Oyibo, W.A., Anuforum, B.C., 1998. Disinfectant/antiparasitic activities of *Jatropha curcas* L. East African Medicinal Journal 75, 508–511.
- Foo, L.Y., Wong, H., 1992. Phyllanthusin D, an unusual hydrolysable tannin from *Phyllanthus amarus*. Phytochemistry 31, 711–713.
- Gbewonoya, W.S., Candy, D.J., 1992. Separation of insecticidal components from an extract of the roots of *Mallotus guineense* (West African black pepper) by gas chromatography. Toxicon: Official Journal of the International Society on Toxicology 30, 1037–1042.

- Goonasekera, M.M., Gunawardana, V.K., Jayasena, K., Mohammed, G., Balasubramaniam, S., 1995. Pregnancy-terminating effect of *Jatropha curcas* L. in rats. *Journal of Ethnopharmacology* 47, 117–123.
- Goutarel, R., Khuong-Huu-Laine, F., 1972. French Demande 2, 087, 982. *Chemical Abstracts* 77, 88757a.
- Govindachari, T.R., Patankar, S.J., WViswanathan, N., 1971. Isolation and structure of two new dihydroisocoumarins from *Kigelia pinnata*. *Phytochemistry* 10, 1603–1606.
- Greger, H., Hofer, O., Werner, A., 1985. New amides from *Spilanthes oleracea*. *Monatshefte für Chemie* 116, 275–277.
- Gunatilaka, A.A., Bolzani, V., da, S., Dagne, E., Hofmann, G.A., Johnson, R.K., McCabe, F.L., Mattern, M.R., Kingston, D.G., 1998. Limonoids showing selective toxicity to DNA repair-deficient yeast constituents of *Trichilia emetica*. *Journal of Natural Products* 61, 179–184.
- Harrigan, G.G., Gunatilaka, A.A., Kingston, D.G., Chan, G.W., Johnson, R.K., 1994. Isolation of bioactive and other oxoaporphine alkaloids from two Annonaceae plants. *Xylopia aethiopica* and *Miliusa cf. banacea*. *Journal of Natural Products* 57, 68–73.
- Hikino, H., Takemoto, T., 1972. Arthropod molting hormones from plants, *Achyranthes* and *Cyathula*. *Die Naturwissenschaften* 59, 91–98.
- Hikino, H., Nomoto, K., Takemoto, T., 1969. Structure of sengosterone, a novel C29 insect-moulting substance from *Cyathula capitata*. *Tetrahedron Letters* 18, 1417–1420.
- Hikino, H., Nomoto, K., Takemoto, T., 1970a. Poststerone, a metabolite of insect metamorphosing substances from *Cyathula capitata*. *Steroids* 16, 393–400.
- Hikino, H., Nomoto, K., Takemoto, T., 1970b. Sengosterone, an insect metamorphosing substance from *Cyathula capitatum* structure. *Tetrahedron* 26, 887–898.
- Hilu, K.W., 1988. Identification of the “A” genome of *Finger millet* using chloroplast DNA. *Genetics* 118, 163–167.
- Hirota, M., Suttajit, M., Suguri, H., Endo, Y., Shudo, K., Wongchai, V., Hecker, E., Fujiki, H., 1988. A new tumor promoter from the seed oil of *Jatropha curcas* L., an diester of 12-deoxy-16 hydroxyphorbol. *Cancer Research* 48, 5800–5804.
- Horiuchi, T., Fujiki, H., Hirota, M., Suttajit, M., Suganuma, M., Yoshioka, A., Wongchai, V., Hecker, E., Sugimura, T., 1987. Presence of tumor promoters in the seed oil of *Jatropha curcas* L. *Japanese Journal of Cancer Research* 78, 223–226.
- Houghton, P.J., Photiou, A., Uddin, S., Shah, P., Browning, M., Jackson, S.J., Retsas, S., 1994. Activity of extracts of *Kigelia pinnata* against melanoma and renal carcinoma lines. *Planta Medica* 60, 430–433.
- Inoue, K., Inouye, H., Chen, C.-C., 1981. A napthoquinone and a lignan from the wood of *Kigelia pinnata*. *Phytochemistry* 20, 2271–2276.
- Isong, E.U., Essien, I.B., 1996. Nutrient and antinutrient composition of three varieties of *Piper* species. *Plant Foods for Human Nutrition* 49, 133–137.
- Jager, A.K., Hutchings, A., van Staden, J., 1996. Screening of Zulu medicinal plants for prostaglandin-synthesis inhibitors. *Journal of Ethnopharmacology* 52, 95–100.
- Joshi, K.C., Singh, P., Taneja, S., Cox, P.J., Howie, R.A., Thomson, R.H., 1982. New terpenoid aldehydes from *Kigelia pinnata*: crystal structure of pinnatal. *Tetrahedron* 38, 2703–2708.
- Joubert, P.H., Brown, J.M., Hay, I.T., Sebata, P.D., 1984. Acute poisoning with *Jatropha curcas* L. (purging nut tree) in children. *South African Medical Journal. Suid-Afrikaanse Tydskrif vir Geneeskunde* 65, 729–730.
- Karlström, P.-O., 1978. Epidermal leaf structures in species of Strobilantheae, Petalideae Acanthaceae. *Botaniska Notiser* 131, 423–433.
- Khafagy, S.M., Mohamed, Y.A., Abdel Salam, N.A., Mahmoud, Z.F., 1977. Phytochemical study of *Jatropha curcas* L. *Planta Medica* 31, 273–277.
- Khuong-Huu, F., Leforestier, J.-P., Maillard, G., Goutarel, R., 1970. L'alchornéine, alcalide dérivé de la tétrahydroimidazo-(1,2a) pyrimidine, isolé de deux Euphorbiacées africaines, *L'Alchornea floribunda* Muell. Arg. et *L'Alchornea hirtella* Benth. *Comptes Rendus hebdomadaires des séances de l'Académie des Sciences. Paris, Série 3. Sciences Chimiques* 270, 2070–2072.
- Khuong-Huu, F., Le Forestier, J.-P., Goutarel, R., 1972. Alchornéine, isoalchornéine et alchornéone, produits isolés de *L'Alchornea floribunda* Muell. Arg. *Tetrahedron* 28, 5207–5220.
- Kleiman, R., Plattner, R.D., Spencer, H.G., 1977. *Alchornea cordifolia* seed oil: a rich source of a new C₂₀ epoxide, (+) cis-14, 15-epoxy-cis-11-eicosenoic acid. *Lipids* 12, 610–612.
- Krishnaswamy, N.R., Prasanna, S., Seshadri, T.R., Vedanthan, T.N.C., 1975. α - and β -Amyrin esters and sitosterol glucoside from *Spilanthes acmella*. *Phytochemistry* 14, 1666–1667.
- Lamkanra, A., Ogundaini, A.O., Ogungbamila, F.O., 1990. Antibacterial constituents of *Alchornea cordifolia* leaves. *Phytotherapy Research* 4, 198–200.
- Lemos, T.L.G., Pessoa, O.P.L., Matos, F.J.A., Alencar, J.W., Craveiro, A.A., 1991. The essential oil of *Spilanthes acmella* (Murr.). *Journal of Essential Oil* 3, 369–370.
- Liu, S.Y., Sporer, F., Wink, M., Jourdan, J., Henning, R., Li, Y.L., Ruppel, A., 1997. Antraquinones in *Rheum palmatum* and *Rumex dentatus* (Polygonaceae), phorbol esters in *Jatropha curcas* L. (Euphorbiaceae) with molluscicidal activity against the schistosome vector snails *Oncomelania*, *Biomphalaria* and *Bulinus*. *Tropical Medicine and International Health* 2, 179–188.
- Longmore, R.B., Robinson, B., 1969. The anti-acetylcholinesterase activities of the alkaloids of *Physostigma venenosum* seeds. *The Journal of Pharmacy and Pharmacology* 21 (Suppl.), 118–125.
- Makkar, H.P., Becker, K., 1999. Nutritional studies on rats and fish (carp, *Cyprinus carpio*) fed diets containing unheated and heated *Jatropha curcas* L. meal of a non-toxic provenance. *Plant Foods for Human Nutrition* 53, 183–192.
- Makkar, H.P., Becker, K., Schmook, B., 1998. Edible provenances of *Jatropha curcas* L. from Quintana Roo state of Mexico. The effect of roasting on antinutrient and toxic factors in seeds. *Plant Foods for Human Nutrition* 52, 31–36.
- Marchand, J., Monseur, X., Pais, M., 1968. Peptide alkaloids, VII. 5. Myrianthines A, B and C, peptide alkaloids of *M. arboreus* P. Beauv. *Annales Pharmaceutiques Françaises* 26, 771–778 (French).
- Matsuse, I.T., Lim, Y.A., Hattori, M., Correa, M., Gupta, M.P., 1999. A search for anti-viral properties in Panamanian medicinal plants. The effect on HIV and its essential enzymes. *Journal of Ethnopharmacology* 64, 15–22.
- McManus, O.B., Harris, G.H., Giangiacomo, K.M., Feigenbaum, P., Reuben, J.P., Addy, M.E., Burka, J.F., Kaczorowski, G.F., Garcia, M.L., 1993. An activator of calcium-dependent potassium channels isolated from a medicinal herb. *Biochemistry* 32, 6128–6133.
- Mildbraed, J., 1913. Von den Bulus genutzte wildwachsende Pflanzen des Südkameruner Waldlandes. *Notizblatt des Königlichen Botanischen Gartens und Museums zu Berlin-Dahlem (Post Steglitz)*, sowie der Botanischen Zentralstelle für die Deutschen Kolonien. Appendix XXVII, 11.
- Moideen, S.V., Houghton, P.J., Rock, P., Croft, S.L., Aboagye-Nyame, F., 1999. Activity of extracts and napthoquinones from *Kigelia pinnata* against trypanosoma brucei brucei and trypanosoma brucei rhodesiense. *Planta Medica* 65, 536–540.
- Mondal, A.K., Parui, S., Mandal, S., 1998. Analysis of the free amino acid content in pollen of nine Asteraceae species known allergenic activity. *Annals of Agricultural and Environmental Medicine* 5, 17–20.
- Moreira, V.M., Maia, J.G., de Souza, J.M., Bortolotto, Z.A., Cavalheiro, E.A., 1989. Characterization of convulsions induced by a hexanic extract of *Spilanthes acmella* var. *oleracea* in rats. *Brazilian Journal of Medicinal and Biological Research* 22, 65–67.
- Mukharya, D.K., Ansari, A.H., 1987. Olean-12-en- β -D-galactopyranosyl (1 \rightarrow 4)- α -L rhamnopyranoside: A new triterpenoidal saponin from the roots of *Spilanthes acmella* (Murr.). *Indian Journal of Chemistry* 26B, 87.

- Nagashima, M., Nakatani, N., 1992. LC-MS analysis and structure determination of pungent amides from *Spilanthes acmella* L. flowers. *Lebensmittel-Wissenschaft und-Technologie* 25, 417–421.
- Nakatani, N., Nagashima, M., 1992. Pungent alkamides from *Spilanthes acmella* L. var. *oleracea* Clarke. *Bioscience, Biotechnology and Biochemistry* 56, 759–762.
- Naktani, M., James, J.C., Nakanishi, K., 1981. Isolation and structures of trichilins, antifeedants against the Southern army worm. *Journal of the American Chemical Society* 103, 1228–1230.
- Nath, L.K., Dutta, S.K., 1991. Extraction and purification of curcain, a protease from the latex of *Jatropha* Linn. *The Journal of Pharmacy and Pharmacology* 43, 111–114.
- N'gouemo, P., Baldy-Moulinier, M., Nguemby-Bina, C., 1996. Effects of an ethanolic extract of *Desmodium adscendens* on central nervous system in rodents. *Journal of Ethnopharmacology* 52, 77–83.
- Nguela, S., Nyasse, B., Tsamo, E., Brochier, M.C., Morin, C.A., 1998. Trachylobane Diterpenoid from *Xylopiya aethiopica*. *Journal of Natural Products* 61, 264–266.
- Nores, M.M., Courreges, M.C., Benencia, F., Coulombie, F.C., 1997. Immunomodulatory activities of *Cedrela lilloi* and *Trichilia elegans* aqueous extracts. *Journal of Ethnopharmacology* 55, 99–106.
- Offiah, V.N., Anyanwu, I.I., 1989. Abortifacient activity of an aqueous extract of *Spondias mombin* leaves. *Journal of Ethnopharmacology* 26, 317–320.
- Ogungbamila, F.O., Samuelsson, G., 1990. Smooth muscle relaxing flavonoids from *Alchornea cordifolia*. *Acta Pharmaceutica Nordica* 2, 421–422.
- Ogunlana, E.O., Ramstad, E., 1975. Investigations into the antibacterial activities of local plants. *Planta Medica* 27, 354–360.
- Okeke, I.N., Ogundaini, A.O., Ogungbamila, F.O., Lamikanra, A., 1999. Antimicrobial spectrum of *Alchornea cordifolia* leaf extract. *Phytotherapy Research* 13, 67–69.
- Omulokoli, E., Khan, B., Chhabra, S.C., 1997. Antiplasmodial activity of four Kenyan medicinal plants. *Journal of Ethnopharmacology* 56, 133–137.
- Osovole, O.A., Ogidi, H.J., Uwaifo, A.O., 1992. Influence of four Nigerian food additives on the mutagenicity of aflatoxin. *African Journal of Medicine and Medical Sciences* 21, 83–87.
- Otaka, T., Uchiyama, M., Okui, S., Takemoto, T., Hikino, H., 1968. Stimulatory effect of insect-metamorphosing steroids from *Achyranthes* and *Cyathula* on protein synthesis in mouse liver. *Chemical & Pharmaceutical Bulletin* 16, 2426–2429.
- Pettit, G.R., Schaufelberger, D.E., 1988. Isolation and structure of the cytostatic lignan glycoside phyllanthostatin A. *Journal of Natural Products* 51, 1104–1112.
- Pettit, G.R., Schaufelberger, D.E., Nieman, R.A., Dufresne, C., Saenz Renauld, J.A., 1990. Antineoplastic agents, 177. Isolation and structure of phyllanthostatin 6. *Journal of Natural Products* 53, 1406–1413.
- Pitasawat, B., Choochote, W., Kanjanpothi, D., Panthong, A., Jitpakdi, A., Chaithon, U., 1998. Screening for larvicidal activity of ten carminative plants. *Southeast Asian Journal of Tropical Medicine Public Health* 29, 660–662.
- Rai, M.K., 1996. In vitro evaluation of medicinal plant extracts against *Pestalotiopsis mango*. *Hindustan Antibiotics Bulletin* 38, 53–56.
- Ramsewak, R.S., Erickson, A.J., Nair, M.G., 1999. Bioactive N isobutyramides from the flower buds of *Spilanthes acmella*. *Phytochemistry* 51, 729–732.
- Rao, C.V., Heidelberg, M., Grosvenor, W.P., 1971. Immunochemical studies of mangle gum (*Rhizophora mangle* L.). *Immunochemistry* 8, 657–663.
- Robinson, B., Robinson, J.B., 1968. The anti-acetylcholinesterase activities of the alkaloids of *Physostigma venenosum* seeds. *Journal of Pharmacy and Pharmacology* 20 (Suppl.), 213+.
- Rodrigues, K.F., Hesse, M., Werner, C., 2000. Antimicrobial activities of secondary metabolites produced by endophytes from *Spondias mombin*. *Journal of Basic Microbiology* 40, 261–267.
- Rojanapo, W., Pimbua, J., Glinsukon, T., Naengehomnong, W., Theb-taranonth, Y., 1987. Failure of diterpenes from *Jatropha curcas* L. to induce mutation in *Salmonella typhimurium* TA98 and TA100. *Research Communications in Chemical Pathology and Pharmacology* 58, 397–400.
- Rojas Hernandez, N.M., Coto Perez, O., 1978. Antimicrobial properties of extracts from *Rhizophora mangle* L. *Revista Cubana de Medicina Tropical* 30, 181–187 (Spanish).
- Rücker, G., Kehrbaum, S., Sakulas, H., Lawong, B., Goeltenboth, F., 1992. Acetylenic glucosides from *Microglossa pyrifolia*. *Planta Medica* 58, 266–269.
- Rug, M., Ruppel, A., 2000. Toxic activities of the plant *Jatropha curcas* L. against intermediate snail host larvae of schistosomes. *Tropical Medicine and International Health* 5, 423–430.
- Salas, J., Tello, V., Zavaleta, A., Villegas, L., Salas, M., Fernandez, I., Vaisberg, A., 1994. Cicatrization effect of *Jatropha curcas* L. latex. *Revista de Biología Tropical* 42, 323–326 (Spanish).
- Sandberg, F., 1980. Medicinal and toxic plants from Equatorial Africa: A pharmacologic approach. *Journal of Ethnopharmacology* 2, 105–108.
- Sandberg, F., Cronlund, A., 1982. An ethnopharmacological inventory of medicinal and toxic plants from Equatorial Africa. *Journal of Ethnopharmacology* 5, 187–204.
- Sandberg, F., Duschewska, H., Christov, V., Spassov, S., 1987. *Spondianthus preussii* var. *Glabe* Engler. Pharmacological screening and isolation of triterpenes. *Acta Pharmaceutica Suecica* 24, 253–256.
- Santesson, C.G., 1926. Einige Drogen aus dem Kamerungebiet und ihre inheimische Verwendung. *Arkiv für Botanik* 20A, 1–34.
- Santesson, C.G., 1929. Drogen aus dem Kamerungebiet II Dimone, Bulule und Meninga. Mittel gegen Schlangenbiss und Dysenterie. *Skandinavisches Archiv für Physiologie* 57, 1–11.
- Sere, A., Kamgue, R.T., Assi, L.A.B.A.A.C., 1982. *Spondianthus preussii* Engl. var. *preussii*, a plant toxic to African cattle, and assay monofluoroacetic acid, an active principle. *Revue d'Élevage et de Médecine Vétérinaire des Pays Tropicaux* 35, 73–82 (French).
- Sparg, S.G., van Staden, J., Jager, A.K., 2000. Efficiency of traditionally used South African plants against schistosomiasis. *Journal of Ethnopharmacology* 73, 209–214.
- Staubmann, R., Neube, I., Gubitz, G.M., Steiner, W., Read, J.S., 1999. Esterase and lipase activity in *Jatropha curcas* L. seeds. *Journal of Biotechnology* 75, 117–126.
- Stirpe, F., Pession-Brizzi, A., Lorenzoni, E., Strocchi, P., Montanaro, L., Sperti, S., 1976. Studies on the proteins from the seeds of *Croton tiglium* and of *Jatropha curcas* L. Toxic properties and inhibition of protein and synthesis in vitro. *The Biochemical Journal* 156, 1–6.
- Tairu, A.O., Hofmann, T., Schieberle, P., 1999. Characterization of the key aroma compounds in dried fruits of the West peppertree *Xylopiya aethiopica* (Dunal) A. Rich (Annonaceae) using arom dilution analysis. *Journal of Agricultural and Food Chemistry* 47, 3285–3287.
- Takemoto, T., Ogawa, S., Nishimoto, N., Hirayama, H., Taniguchi, S., 1968. Studies on the constituents of *Achyranthes radix*, VII. The insect-moulting substances in *Achyranthes* and *Cyathula* genera “supplement”. *Yakugaku Zasshi Journal of the Pharmaceutical Society of Japan* 88, 1293–1297 (Japanese).
- Tessier, A.M., Paris, R.R., 1974. A toxic Euphorbiaceae: *Spondianthus preussii* Engler: presence of substances of the cucurbitacin group. *Annales Pharmaceutiques Françaises* 32, 177–182 (French).
- Thomas, D.W., Thomas, J.M., Bromley, W.A., Mbenkum, F.T., 1989. Korup Ethnobotany Survey. Final Report to The World Wide Fund for Nature. Godalming, Surrey, UK.
- Tiwari, H.P., Kakkar, A., 1990. Phytochemical examination of *Spilanthes acmella* {sic} (Murr). *Journal of the Indian Chemical Society* 67, 784–785.
- Traore-Keita, F., Gasquet, M., Di Giorgio, C., Ollivier, E., Delmas, F., Keita, A., Doumbo, O., Balansard, G., Timon-David, P., 2000. Antimalarial activity of four plants used in traditional medicine in Mali. *Phytotherapy Research* 14, 45–47.

- Tona, L., Kambu, K., Ngimbi, N., Cimanga, K., Vlietinck, A.J., 1998. Antiamoebic and phytochemical screening of some Congolese medicinal plants. *Journal of Ethnopharmacology* 61, 57–65.
- Tona, L., Kambu, K., Mesia, K., Cimanga, K., Apers, S., De Bruyne, T., Pieters, L., Totte, J., Vlietinck, A.J., 1999. Biological screening of traditional preparations from some medicinal plant antidiarrhoeal in Kinshasa, Congo. *Phytomedicine: International Journal of Phytotherapy and Phytopharmacology* 6, 59–66.
- Tona, L., Kambu, K., Ngimbi, N., Mesia, K., Penge, O., Lusakibanza, M., Cimanga, K., De Bruyne, T., Apers, S., Totte, J., Pieters, L., Vlietinck, A.J., 2000. Antiamoebic and spasmolytic activities of extracts from some antidiarrhoeal traditional preparations used in Kinshasa, Congo. *Phytomedicine: International Journal of Phytotherapy and Phytopharmacology* 7, 31–38.
- Troupin, G., 1982. *Plantae africanae*. XI (Acanthaceae, Melastomataceae, Sapotaceae). *Bulletin du Jardin Botanique National de Belgique* 52, 463–465.
- Udoh, F.V., 1999. Uterine muscle reactivity to repeated administration and phytochemistry and seed extracts of *Piper guineense*. *Phytotherapy Research* 13, 55–58.
- Udoh, F.V., Lot, T.Y., Braide, V.B., 1999. Effects of extracts of seed and leaf of *Piper guineense* on skeletal muscle of rat and frog. *Phytotherapy Research* 13, 106–110.
- Utsalo, S.J., Onoyom-Ita, V., Ifeanyi-Chukwu, M., Akpan, J.O., 1990. Home medication and microbiological profile in chronic otitis media in Nigerian children. *The Central African Journal of Medicine* 36, 278–283.
- van der Berg, A.J., Horsten, S.F., Kettenes-van den Bosch, J.J., Kroes, B.H., Beukelman, C.J., Leeflang, B.R., Labadie, R.P., 1995. Curcacycline A—a novel cyclic octapeptide isolated from the latex of *Jatropha curcas* L. *FEBS Letters* 358, 215–218.
- Villegas, L.F., Fernandez, I.D., Maldonado, H., Torres, R., Zavaleta, A., Vaisberg, A.J., Hammond, G.B., 1997. Evaluation of the wound-healing activity of selected traditional medicine from Peru. *Journal of Ethnopharmacology* 55, 193–200.
- Walker A.A.R. 1952. Usages pharmaceutiques des plantes spontanées du Gabon. *Bulletin de l'Institut de l'Études Centrafricaines* No. 4, 181–186.
- Walker A.A.R. 1953. Usages pharmaceutiques des plantes spontanées du Gabon. *Bulletin de l'Institut de l'Études Centrafricaines* Nos. 5 and 6, 19–40, 275–330.
- Wall, M.E., Wani, M.C., Taylor, H., 1987. Plant antitumor agents, 27. Isolation, structure, and structure activity related alkaloids from *Fagora macrophylla*. *Journal of Natural Products* 50, 1095–1099.
- Walsh, G.E., Hollister, T.A., Forester, J., 1974. Translocation of four organochlorine compounds by red mangrove (*Rhizophora mangle* L.) seedlings. *Bulletin of Environmental Contamination and Toxicology* 12, 129–135.
- Watt, J.M., Breyer-Brandwijk, M.G., 1962. *The Medicinal and Poisonous Plants of Southern and Eastern Africa*, second ed. E&S Livingstone, Ltd., Edingburgh and London, pp. 744, 1062.
- Weiss, C.R., Moideen, S.V., Croft, S.L., Houghton, P.J., 2000. Activity of extracts and isolated naphthoquinones from *Kigelia pinnata* against *Plasmodium falciparum*. *Journal of Natural Products* 63, 1306–1309.
- Williams, L.A., 1999. *Rhizophora mangle* (Rhizophoraceae) triterpenoids with insecticidal activity. *Die Naturwissenschaften* 86, 450–452.
- Wong, M.H., Lau, W.M., 1985. Root growth of *Cynodon dactylon* and *Eleusine indica* collected from motorways at different concentrations of lead. *Environmental Research* 36, 257–267.
- Wästberg, P., 1986. *Eldens Skugga (Shadow of Fire)*. W&W, Stockholm, Swedish.
- Wästberg, P., 1987. *Bergets källa (Source in Mountain)*. W&W, Stockholm, Swedish.
- Yamamoto, E., Baird, W.V., 1999. Molecular characterization of four beta-tubulin genes from dinitroaniline and resistant biotypes of *Eleusine indica*. *Plant Molecular Biology* 39, 45–61.
- Yamamoto, E., Zeng, L., Baird, W.V., 1998. Alpha-tubulin missense mutations correlate with antimicrotubule drug *Eleusine indica*. *The Plant Cell* 10, 297–308.
- Yoshida, T., Haba, K., Arata, R., Okuda, T., Shingu, T., 1987. Structures of new hydrolysable tannin oligomers from melastomataceous plants. *Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 29, 676–683.
- Yoshida, T., Itoh, H., Matsunaga, S., Tanaka, R., Okuda, T., 1992. Tannins and related polyphenols of Euphorbiaceae plants IX. Hydrolyzable tannins with ¹C₄ glucose core from *Phyllanthus flexuosus* Muell Arg. *Chemical & Pharmaceutical Bulletin* 40, 53–60.
- Zdero, C., Bohlmann, F., Mungai, G.M., 1990. Rearranged clerodanes and other diterpenes from *Microglossa pyrrhopappa*. *Phytochemistry* 29, 3233–3241.
- Zeng, L., Baird, W.V., 1999. Inheritance of resistance to anti-microtubule dinitroaniline herbicides in an “intermediate” resistant biotype of *Eleusine indica* (Poaceae). *American Journal of Botany* 86, 940–947.