

## **Anchomanes difformis: A Multipurpose Phytomedicine**

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**Abstract:** *Anchomanes difformis* (Blume) Engl. Pallidus, commonly known as forest *Anchomanes* is a plant of the family Araceae in the order Arales indigenous to the African continent. *Anchomanes difformis* is a multipurpose plant that has been used broadly in treatment of a variety of ailments traditionally. It has been used traditionally in the treatment of Hernia, oedema, constipation, heartburns, tuberculosis, prostatitis, Anuria, constipation, scabies, rheumatism, asthma, diarrhea, vertigo, Epilepsy, leprosy, diabetes, sleeping sickness, psychiatric illness, Jaundice, filariasis, Kidney pain. Studies have been carried out on the analgesic, anti-inflammatory, anti-asthmatic, anti-ulcer, anti-microbial, antioxidant, diuretic and laxative effects of the plant.

**Keywords:** *Anchomanes difformis*, Araceae, multipurpose plant, antioxidant

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### **I. Introduction**

*Anchomanes difformis* (Blume) Engl. Pallidus, commonly known as forest *Anchomanes* is a plant of the family Araceae in the order Arales indigenous to the African continent. It grows widely in rainforests of West Tropical Africa including Nigeria, Ghana, Cote d'Ivoire, Sierra Leone, Senegal, and Togo. <sup>[1]</sup> *Anchomanes difformis* is a large herbaceous plant growing about 2 metres high. It has a growing horizontal tuber that measures up to 80cm by 20cm across, the plant has broad divided leaf with a fleshy thorny stem <sup>[2]</sup>. *Anchomanes difformis* is recognized by the following names in Nigeria: olumahi<sup>3</sup> by the Igbos, ebaenan by the Efik, chakara by the Hausa, boubekeodu by the Ijaw, abrisoko by the Yoruba in South West of Nigeria, Olikhoror by the Bini tribe of Edo state <sup>[3]</sup>. *Anchomanes difformis* is a multipurpose plant that has been used broadly in treatment of a variety of ailments traditionally <sup>[4]</sup>. This review highlights the multipurpose medicinal use of this plant traditionally, phytochemical constituents and pharmacological properties of this plant.

### **II. Medicinal Uses of Different Parts of *Anchomanes difformis***

#### **Rhizome**

The rhizome is used in treatment of gonorrhoea, abdominal pain, Hernia, oedema, constipation, heartburns, tuberculosis, prostatitis, Anuria, constipation, scabies, rheumatism, asthma, diarrhea, vertigo, Epilepsy, leprosy, diabetes, sleeping sickness, psychiatric illness, Jaundice, filariasis, Kidney pain, rubefacient, vesicant, diuretic and Poison antidote <sup>[5]</sup>.

#### **Roots**

The roots are used to treat cough, diabetes, dysentery, throat problems <sup>[6]</sup>.

#### **Leaves**

Leaves are used as galactagogue, cough, and purgative <sup>[7]</sup>.

#### **Stems**

The stems are used to ease child birth, used as diuretic, purgative <sup>[8]</sup>.

### **III. Phytochemical Constituents**

The compounds, 12-heptadecenoic acid, hexadecanoic acid and  $\beta$ -stigmasterol were isolated from the rhizome of *Anchomanes difformis*. These compounds showed significant activity against *Onchocerca ochengi* <sup>[9]</sup>. Proximate analysis of the tuber revealed the presence of carbohydrates 63.64 %, protein 1.31 %, fat 1.5 %, and crude fibre content 12.3 %. The methanol, acetone and n-butanol extracts revealed the presence of flavonoids, tannins and saponins <sup>[4, 10]</sup>.

### **IV. Pharmacological Properties And Medicinal Uses Of *Anchomanes difformis***

#### **4.1. Analgesic activity and Anti-inflammatory activity**

The methanol extract of *Anchomanes difformis* rhizome proved effective in-vivo against formalin induced paw licking and lifting. At a dose of 500mg/kg and 1000mg/kg in both first and second phases, it was as

effective as indomethacin 10mg/kg in the formalin induced paw licking and lifting model. The extract at a dose of 500mg/kg showed significant decrease in abdominal constrictions comparable to Indomethacin 10mg/kg in the acetic acid induced abdominal constriction model<sup>[11]</sup>. This provides a scientific basis for its use as a pain reliever traditionally<sup>[5]</sup>. The ethanol leaves extract of *Anchomanes difformis* showed significant reduction in oedema at high dose (800 and 1600 mg/kg) in the egg induced albumin oedema<sup>[12]</sup>

#### 4.2. Anti-Ulcer activity

The ethyl acetate fraction of *Anchomanes difformis* extract was investigated for anti-ulcer activity using the ethanol-induced and pylorus ligation induced ulceration models. Pre-administration of the extract (200 and 500mg/kg) significantly reduced the total acid output and reduced stomach lesions in the pylorus ligation model but had no effect on gastric secretions and acidity. In the ethanol induced ulceration model, the severity of the ulcer was significantly ( $P < 0.001$ ) reduced when pretreated with the ethyl acetate fraction. The extract showed negative acid neutralizing effect. The study confirms that the ethyl acetate fraction of the plant has some degree of gastroprotective effect and provides rationale for the use of the plant by local people to treat ulcers<sup>[13]</sup>. The aqueous extract showed activity similar to the ethyl acetate fraction<sup>[14]</sup>

#### 4.3. Anti-asthmatic activity

Iduet et al., 2016<sup>[15]</sup> investigated the anti-asthmatic effect of the aqueous leaf extract. Evaluating the anti-asthmatic effect on the Histamine induced bronchoconstriction, tracheal fluid volume and tracheal fluid viscosity. The aqueous leaf (400mg/kg) extract proved as effective as the standard drug salbutamol in asthma protection in the histamine induced bronchoconstriction model. The extract had no significant effect on tracheal fluid volume and viscosity.

#### 4.4. Anti-diabetic activity

The ethanol extract of *Anchomanes difformis* leaves showed significant reduction in fasting blood glucose level in Alloxan-induced diabetes model. The result was comparable to the standard drug glibenclamide<sup>[16]</sup>. The ethanol extract of the root significantly reduced plasma glucose of diabetic rats but had no effect on normoglycemic rats. This shows that the plant has anti-hyperglycemic effect with no hypoglycemic effect<sup>[17]</sup>.

#### 4.5. Anti-microbial activity

Essential oils extracted from the leaves, stem and roots were investigated for antimicrobial activity against *Klebsiella pneumoniae*, *Bacillus subtilis*, *Staphylococcus aureus*, and *Pseudomonas aeruginosa* and three species of fungi *Candida albicans*, *C. stellatoidea*, and *C. torulopsis* using agar well diffusion methods and minimum inhibitory concentrations. All the bacteria showed some degree of sensitivity to the oils except *Pseudomonas aeruginosa* which was resistant to the leaf but has some susceptibility to the stem and root. *C. torulopsis* showed sensitivity against essential oil from the stem while the remaining fungi were resistant<sup>[18]</sup>

#### 4.6. Anti-onchocercal activity

The methanol extract of *Anchomanes difformis* rhizome is reported to have 100% inhibition on *Onchocerca ochengi* closely related species of *Onchocerca volvulus*. This justifies its use traditionally in treatment of filarial worms<sup>[9]</sup>

#### 4.7. Effect on female sex hormone

Egwurugwu et al., 2016 investigated the ethnobotanical claim of using *Anchomanes difformis* rhizome in treatment of uterine fibroid by assessing the effect of the plant on female sex hormone levels in female albino rats. The levels of estradiol, follicle stimulating hormone, prolactin, luteinizing hormone and progesterone in the serum were evaluated after administering the plant. The study showed dose dependent decrease in the serum levels of estradiol and progesterone in the test groups after two weeks of treatment and significant decrease in luteinizing hormone which was not dose dependent<sup>[19]</sup>

#### 4.8. Laxative and Diuretic effect

The extracts (aqueous and ethanol) of the *Anchomanes difformis* rhizome were evaluated for laxative and diuretic effects by measuring latency time, frequency and total volume excreted of feces and urine respectively. The physical state of the feces was also examined. *Anchomanes difformis* extracts showed a significant increase in the latency of the first feces excretions at doses of 400 and 800 mg/kg and total fecal mass excreted at a dose of 800 mg/kg<sup>[5]</sup>

#### 4.9. Antioxidant activity

Abubakaret al., 2013 evaluated the antioxidant activity by measuring the free radical scavenging activity using 1,1-diphenyl-2-picrylhydrazyl radical (DPPH), reducing power assay, total antioxidant capacity of the phosphomolybdenum method and the total phenolic content using the Folin- Ciocalteu reagent on the acetone, n-butanol and methanol root extracts of *Anchomanes difformis*. The n-butanol extract has significantly ( $p < 0.05$ ) high phenolic content. The extracts showed strong concentration dependent radical scavenging activity. The results showed that the n-butanol extract has strong reducing ability which is analogous to that of gallic acid<sup>[4]</sup>

#### 4.10. Insecticidal activity

Powdered rhizome of *Anchomanes difformis* is reported to have insecticidal activity. The insecticidal activity was tested on *Sitophiluszeamais*, *Triboliumcastaneum*, *Oryzaephilusmercator*, *Callosobruchusmaculatus*, *Lasiodermaserricornes*. The plant was effective against all the beetle species showing 100% effectiveness against *Callosobruchusmaculatus*<sup>[20]</sup>

### V. Conclusion

*Anchomanes difformis* is a multipurpose plant that has been used broadly in treatment of a variety of ailments traditionally. Various studies have confirmed some of the Ethnomedicinal uses of the plant. According to this review, the plant is a potential analgesic, anti-inflammatory, anti-asthmatic, anti-ulcer, anti-microbial, antioxidant, diuretic and laxative. Advance studies are needed to isolate the compounds responsible for these pharmacological activities.

### References

- [1]. Ataman J, Idu M. Renal effects of *Anchomanes difformis* crude extract in wistar rats. *Avicenna Journal of Phytomedicine*. 2015; 5 (1):17-25.
- [2]. Burkill HM. The useful plants of West Africa. 2nd Edn., The Royal Botanical Gardens, Ithaka Harbors Incorporation, Kew, UK;1985. ISBN-10: 094764301X.
- [3]. Egwurugwu J. N., Nwafor A., B. C. Chinko2, K. C. Ugoeze3, R. C. Uchefuna4, M. C. Ohamaeme5 and M. C. Ebuenyi Effects of Extracts of *Anchomanes difformis* on Female Sex Hormones: Preliminary Results, *Asian Journal of Medicine and Health* 1(6): 1-9, 2016; Article no.AJMAH.30286 sciencedomaininternationalwww.sciencedomain.org
- [4]. Abubakar B. Aliyu, Mohammed A. Ibrahim, Aliyu M. Musa, Aisha O. Musa, Joyce J. Kiplimo and Adebayo O. Oyewale, Free Radical Scavenging and Total Antioxidant Capacity of Root Extracts of *Anchomanes difformis* (Araceae), *Acta Polonicae Pharmaceutica n Drug Research*, Vol. 70 No.1 pp. 115n121, 2013 ISSN 0001-6837 Polish Pharmaceutical Society
- [5]. NsondeNtandou GF, Kimpouni V, Loufoua BAE, Yengozo BP, Etou-Ossibi AW, Elion Itou RDG, Ouamba JM and Abena AA, 2017, Laxative and diuretic effects of *Anchomanes difformis* (Araceae), *Journal of pharmacognosy and Phytochemistry*. E-ISSN: 2278-4136 P-ISSN: 2349 8234 JPP 2017; 6(3): 234-242
- [6]. Oyetayo VO (2007) Comparative Studies of the phytochemical and antimicrobial properties of the leaf, stem and tuber of *Anchomanes difformis*. *J Pharm Toxicol* 2007, 2: 407-410.
- [7]. Burkill, H.M. 1985. The useful Plants of tropical Africa Vol. 1
- [8]. Oyetayo VO. Comparative studies of the phytochemical and antimicrobial properties of the leaf, stem and tuber of *Anchomanes difformis*. *Journal of Pharmacology and Toxicology*. 2007;2(4):407-410.
- [9]. Nkoh J. Nkoh1, Moses N. Ngemenya, Moses Samje3, Joseph N. Yong1 Anti-onchocercal and antibacterial Activities of crude extracts and Secondary Metabolites from the Rhizome of *Anchomanes difformis* (Araceae), *Journal of The Cameroon Academy of Sciences* Vol. 12 No. 1 (2015)
- [10]. Idowu Doyinsola, Adebisi Adedayo, Olajide Olutayo, Afolayan Michael, Orishadipe Abayomi\*, Omojola Moses and Sunday Thomas (2012), Phytochemical, Antioxidant and Cytotoxicity Properties of *Anchomanes Difformis* (bl.) Engl. Tuber Extract, *International Journal of Pure and Applied Chemistry (IJPAC)*, Vol 7(4).
- [11]. Eke Ifeanyi Gabriel, Obioha Felix Chidiebere, Anaga, Aruh Ottah, *International Journal of Basic and Applied Sciences*, 2(4) (2013), 289-296, Science Publishing Corporation
- [12]. Abiodun Humphrey Adebayo, Lucy Binda John-Africa, Amarachi Grace Agbafor, Omolola, Elizabeth Omotosho1 and Timothy Olusoji Mosaku1 (2014) Anti-nociceptive and anti-inflammatory activities of extract of *Anchomanes difformis* in rats, *J. Pharm. Sci.*, Vol.27, 2014, pp.265-270.
- [13]. Stephen O Okpo, Fidelis P Ching2, Buniyamin A Ayinde, Onajite O Udi, Peter O Alonge, Gerald O Eze Gastroprotective Effects of the Ethyl Acetate Fraction of *Anchomanes difformis* (Engl) *International Journal of Health Research* 2011 Dec; 4(4): 155-161
- [14]. Okpo, S. O., Ayinde B. A., 1Ugwa, Z. I., 3Ching, F. P., 4Alonge, P. O. and 1Udi, O. O. (2012), Anti-Ulcer Activity of The Aqueous Extract Of *Anchomanes difformis*, *Nigerian Journal of Pharmaceutical Sciences* Vol. 11, No.1, March, 2012, ISSN: 0189-823X, P. 58-65
- [15]. Idu MacDonald, Ovuakporie-Uvo Oghale, *Phytochemistry, anti-asthmatic and antioxidant activities of Anchomanes difformis* (Blume) Engl. leaf extract, *Asian Pacific Journal of Tropical Biomedicine, Asian Pac J Trop Biomed* 2016; 6(3): 225-231
- [16]. Shorinwaolusayoaderonke, Aganyajanezewanne, (2015), evaluation of antidiabetic effect of the ethanol extract of *Anchomanes difformis* leaf extract on albino rats, *International Research Journal of Pharmacy*. 6(2), ISSN 2230-8407
- [17]. Adeyemi1, T. T. Makinwa2, R. N. Uadia 2015, Ethanol Extracts of Roots of *Anchomanes difformis* (Engl) Roots as an Antihyperglycemic Agent in Diabetic Rats, *Chemistry Journal* Vol. 1, No. 3, 2015, pp. 68-73 <http://www.publicscienceframework.org/journal/cj>
- [18]. Adeleke Osho and Adetunji T. 2010, Antimicrobial activity of *Anchomanes difformis* (Blume) Engl (Family Araceae), *acta SATECH* 3 (2): 87 - 90 (2010), *Journal of life and physical science*

- [19]. Egwurugwu J.N., O Chinko B.C.3, Ebuenyi M.C.4, Akunneh-Wariso C.C. Ugwuezumba P.C. and Ezekwe S.R.6 hamaeme M.C .Effects of extracts of *Anchomanes difformis* on haematological parameters of albino wistar rats. International Research Journal of Vol. 5(3), 1-6, May (2017) E- ISSN 2320 –7353 Int. Res. J. Medical Sci.
- [20]. Akinkulore R.O, Assesment of the Insecticidal Properties of *Anchomanes difformis* powder on Five Beatles species. Journal of Entomology 4(1): 51-55, 2007. ISSN 1812-5670

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