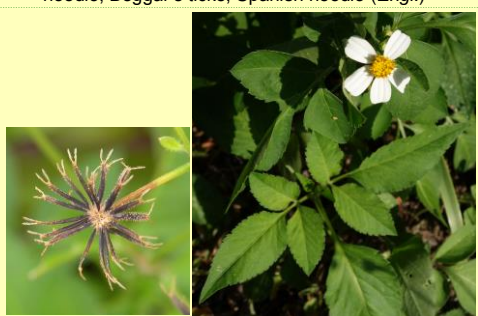


# Promotion and Preservation of traditional Plant-Medicines

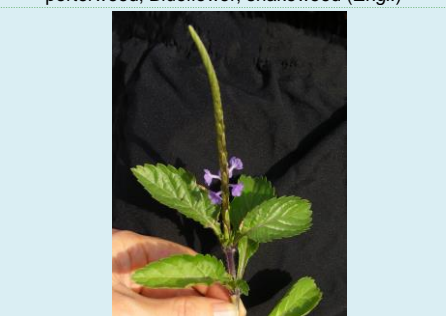
## Introduction into „Modern Spirit“ - An Example

**(A) • *Bidens alba* / *pilosa* (L.) DC.**  
 • (*Asteraceae* = *daisy-composite family*) • Shepherd's needle, Beggar's ticks, Spanish needle (Engl.) •



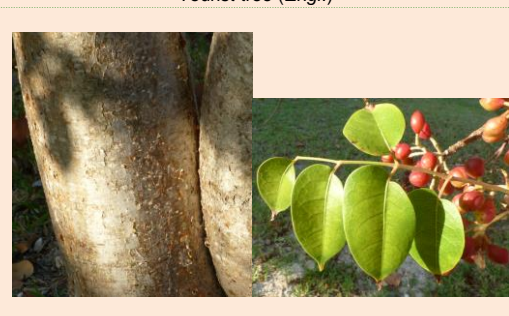
**Known active components:** • in. ex. B. Centaurein, Centaureidin, Polyacetylene, Phenylheptatriyn (PHT), Polyynes, 1,2-Dihydroxy-trideca-3,5,7,9,11-Pentayn.  
 • Triterpene, Flavonoids, Aurone, Chalkone, Luteolin, 1-Phenyl-1,3-diyln-5-en-7-ol-acetat, Kaffeate, Ethyl-Kaffeate.

**(B) • *Stachytarpheta jamaicensis* (L.) Vahl**  
 • (*Verbenaceae* = *herb-of-the-cross, vervain*) • Blue porterweed, Blueflower, snakeweed (Engl.) •



**Known active components:** • in. ex. Verbascoside, Flavonoids, Glycosides, Phenylethanoid- and -Glycosides, Anthrachinones.  
 • Verbascosides, Flavonoids, Iridoids, Ipolamiide, Acetoside, Fulvoipolamiide, Sesquiterpenlactone, Proazulene.

**(C) • *Bursera simaruba* (L.) Sarg.**  
 • (*Burseraceae* = *incense tree*) • Gumbolimbo, Gum Elemi, Tourist tree (Engl.) •



**Known active components:** • in. ex. 11 bark contents, like Lignan, Yatein,  $\beta$ -peltatin-O- $\beta$ -D-Glucopyranosides, Hinokinin, Bursehemin, Phenolic contents, Terpenoids, Resin.  
 • Vit E, Methyl-beta-peltatin (presumptive), and others.

**Material/Methods**

**Plants:** aerial parts from: A: *Bidens alba*, B: *Stachytarpheta jamaicensis*, C: *Bursera simaruba*.

**Dried Samples** of the ethanolic single extracts and 1:1 (w/w) Extract-combinations of all aerial Plants with Reflow-extraction followed by drying.

**1 • Cytotoxicity in HaCaT-Cells:**  
 • Cell-proliferation-assay (Mosmann), 1983 (J. of Immunological Methods 65, 55-63). Determination of IC<sub>50</sub>-data from the dose-response-graphs (triple determination). Positive control: Doxorubicin.

**2 • Antimikrobiel Effects:**  
 Determination of minimum inhibitory concentration (MIC) as well as minimum bactericidal concentration (MBC) against the following strains of bacteria:

**Gram-positive Bacteria:**  
 • Methicillin resistant *Staphylococcus aureus* MRSA NCTC 10442  
 • *Staphylococcus aureus* ATCC 25923  
 • *Staphylococcus epidermidis* ATCC 14990

**Gram-negative Bacteria:**  
 • *Pseudomonas aeruginosa* ATCC 27853 and  
 • *Acenitobacter baumannii* ATCC BAA747  
 • MIC-determination with microbouillon-dilution method according to NCCLS (2006). MBC-definition as lowest extract concentration, which eliminates the microorganisms in total. Triple-testing with Streptomycin and Vancomycin as positive control.

**3 • Anti-Inflammatory Effects**  
 • Spectrometric determination of the inhibition of the **5-Lipoxygenase (5-LOX)**. Measurement of the IC<sub>50</sub>-concentration (Triple-test). Positive control: NDGA (Nordihydroguajaretacid).

**Results**

**1 • Cytotoxicity of the Plant Extracts:**  
**All extracts are not critical regarding cytotoxicity.** The following IC<sub>50</sub>-data of the single extracts were determined:  
 • Positive controls: 8.06 +/- 2.03 µg/ml  
 • Single extracts: 527 - 2400 µg/ml

**2 • Antimicrobial Effect, such as the ethanolic Extracts:**  
 • The extracts from *Bidens alba* (A) and *Stachytarpheta jamaicensis* (B) show significant activity against gram-positive bacteria and especially also against MRSA.  
 • The Test results show no variations (Standard deviation = 0).

**Table 1: Anti-microbial Activity of the Single Plant Extracts**

Test Germa	MIC	MBC	MIC	MBC	MIC	MBC	MIC	MBC	MIC	MBC
	C [mg/ml]		B [mg/ml]		A [mg/ml]		Van [µg/ml]		Strep [µg/ml]	
MRSA NCTC 10442	>8	>8	2	4	4	>4	1	2	./.	n.b.
S. aureus ATCC 25923	>8	>8	1	4	2	4	0,5	0,5	2	8
S. epid. ATCC 14990	>8	>8	1	2	1	2	1	2	1	8
P. aerug. ATCC 27853	>8	>8	>4	>4	>4	>4	./.	n.b.	4	8
Ac. baum. ATCC BAA747	8	>8	4	>4	4	>4	64	128	2	4

Combinations showed similar data compared to those of the strongest single extracts.

**Table 2: Antimicrobial Activity of the Plant Extracts in Combinations: (1:1 mixtures)**

Test Germs	MIC	MBC	MIC	MBC	MIC	MBC
	A / B		A / C		B / C	
MRSA NCTC 10442	2/2	>2/2	>2/2	>2/2	2/2	>2/2
S. aureus ATCC 25923	1/1	>2/2	2/2	>2/2	1/1	>2/2
S. epid. ATCC 14990	1/1	2/2	1/1	>2/2	1/1	2/2

**3 • Anti-Inflammatory Effect of the ethanolic Extracts:**  
 The ethanolic plant extracts of ethanolic *Bidens alba* (A), *Stachytarpheta jamaicensis* (B) and *Bursera simaruba* (C) inhibit the 5-LOX. The combination of the ethanolic single extracts shows additive effects for this 5-LOX-inhibition.


**Table 3: Anti-Inflammatory Activity of the single Plant Extracts and -Combinations (1:1 Mixtures)**

	Positive Control	Negative Control	Single Extracts			Extract-Combination 1:1 Mixture		
	NDGA	Doxorubicin	A	B	C	A / B	A / C	B / C
5-LOX Inhibition [µg/ml]	0,53 ± 0,09	./.	139 ± 7	84 ± 10	132 ± 13	52 ± 1,3	78 ± 6	57 ± 8

**4 • Example for Usage, Indications:**

Extracts/tinctures/ointments can be adjusted to an individual pH-value for a particular indication for the skin, mucous membranes, external ear etc.:

**EXAMPLES:** • Dry skin, pruritus, scratch marks, urticarial eczema left lower arm.  
 Tincture: Application about 1 – 4 times a day. Ethanolic extract of about 200 mg (A+B+C) over 5 days.  
 • Relief during the same day.  
 • After 2 days some scratch marks (crusts) left, but dry skin.  
 • From the 5th day on just a few small rests of scratch marks.



**Conclusion:**

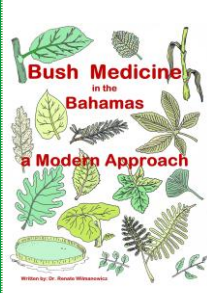
• *Bidens alba*, *Stachytarpheta jamaicensis* and *Bursera simaruba* are healing plants, described in the traditional Medicine of the Bahamas.

• The results presented here document their harmlessness with state-of-the-art methods.

• Unexpected additive effects regarding the anti-inflammatory activities could be shown.

• The additionally stated effect against multi-resistant microbes such as MRSA of these three plants, especially in combination, indicate a special potential for an establishing of dermatological phytopharmaceuticals.

**Bush Medicine in the Bahamas**  
 a Modern Approach



**Dr. Renate Wilmanowicz**

- Information about author, intention, glossary
- 70 plants •

[www.bush-medicine.com](http://www.bush-medicine.com)  
[infos@bush-medicine.com](mailto:infos@bush-medicine.com)