

Weed Resources of Pesticide in Mount Changbai area of China

MINGGEN WU, Wang lili, Shi dan

College of Agriculture, University of Yanbian, Jilin, China

Foreword

Weeds are the most noxious plant in crop production when they have happened to farmland. But it has happened to non-farmland, those are very important resources to our daily life. The human makes resources of the utility plants into Medicines, pesticides, foods, dyes, cellulose etc.

The Changbai Mountain, rising in the northeast China, attains the greatest elevation in the region, with its highest peak reaching 2,744 m. Changbaishan massif is the most typical natural composite body in the Eurasia Continent regarded as a rare genebank of plant species and natural museum in the world.

1. Resources of Insecticides Weeds and its Present Situation of development

Investigation discovers that there are

resources of insecticides plants in Changbai mountain. The result shows, there are 182 species of botanical insecticides plants, which belong to 63 families. Among them, the most is Compositae which has 23 species, secondly is Ranunculaceae which has 18 species, thirdly is Labiatae which has 13 species. On activity part, the active substances have 102 species on the whole plant of these, active substances have 67 species in root, tuber and stem, 34 species in branch and leaf, 14 species in Fruit, seed and flower. There are the most kinds of prevention and cure of pathogen to *Caorus alamus*, which up to 32 species, secondly is *Sophora flavescens* which has 26 species, Phrymaceae and so on which have more species, each one is more than 10 species. On the mode of action, not ascertaining is more, but have ascertained which are main poison-killed, Repel food, avoid meeting and insect-resistance, a few has Tick-resistance or mite-resistance.

Table 1. Weedy Species of Insecticidal Botany in Mt.Changbai

Sci.name	Activity part	Toxic chemical	Toxicity mechanism	Target insect pest
<i>Equisetum arvense</i>	Whole plant	Heterosides	Antifeeding Toxicity	<i>Pieris rapae</i> , <i>Aphis glycines</i>
<i>Humulus scandens</i>	Whole plant	Cosmosiin nitexin, β -humulone caryophyllene humulone	Antifeeding	<i>Aphidoidea</i>

<i>Polygonum lapathifolium</i>	Whole plant		Antifeeding	<i>Athalia rosae japonensis</i> , <i>Cassida nebulosa</i> , <i>Pieris brassicae</i> , <i>Aphis gossypii</i>
<i>Amaranthus retroflexus</i>	Whole plant			<i>Athalia rosae japonensis</i> , <i>Hyphantria cunea</i> , <i>Pieris rapae</i>
<i>Portulaca oleracea</i>	Whole plant			<i>Aphis gossypii</i> , <i>Vegetable aphides</i> , <i>Athalia rosae japonensis</i> , <i>Pieris brassicae</i> , <i>Mythimna separata</i> ,
<i>Aconitum kusnezoffii</i>	Root tuber			<i>Rice grasshopper</i> , <i>Rice borer</i> , <i>Aphis gossypii</i> , <i>Pieris rapae</i> , <i>Agrotis</i> , <i>Spodoptera litura</i> , <i>Aphis glycines</i>
<i>Pulsatilla chinensis</i>	Root	Protoanemonin, Anemonin		<i>Aphis gossypii</i> , <i>Vegetable aphides</i> , <i>Aphis glycines</i> , <i>Agrotis</i> , <i>Mythimna separata</i> , <i>Pieris rapae</i>
<i>Ranunculus</i>	Whole plant	Protoanemonin, Anemonin,		<i>Rice borer</i> , <i>Aphidoidea</i> ,
<i>Sophora flavescens</i>	Roots and seed	Alkloids(d-matrine\ d-oxyma-trine)	Antifeeding Toxicity	<i>Sugar beet aphides</i> , <i>Aulacophuora lewisii</i> , <i>Tryporyza incertulas</i> , <i>rice planthopper</i> , <i>Agrotis</i> , <i>Pieris rapae</i> , <i>Helicoverpa assulta</i> , <i>Tetranychus cinnabarinus</i> , <i>rice borer</i> , <i>Aphis gossypii</i> ,
<i>Euphorbia fisheriana</i>	Root	jolkinolide		<i>Cnaphalocrocis medinalis</i> , <i>Colaphellus bowringii</i> , <i>Aphis gossypii</i> , <i>Aphis glycines</i> , <i>Pieris rapae</i> ,
<i>Abutilon theophrasti</i>	Seed		Antifeeding	<i>Attagenus piceus</i> , <i>Pieris rapae</i>
<i>Metaplexis japonica</i>	Whole plant			<i>Aphis glycines</i>
<i>Mentha haplocalyx</i>	Whole plant		Toxicity	<i>Aphis glycines</i>
<i>Datura stramonium</i>	Rood and stems			<i>Artogeia canidia</i> , <i>Ostrinia furnacalis</i> , <i>rice borer</i> , <i>Cnaphalocrocis medinalis</i> <i>Tetranychus viennensis</i> , <i>Aphidoidea</i>
<i>Artemisia scoparia</i>	Leaf			<i>Vegetable aphides</i>
<i>Artemisia annua</i>	Whole plant	Arteannuin, arteannuic acid, Dihydroarteannuic acid		<i>Aphis gossypii</i> <i>Tetranychus viennensis</i> , <i>rice borer</i> , <i>Pieris rapae</i> , <i>Mythimna separata</i> , <i>Sitophilus zea-mais</i> ,
<i>Artemisia apillaris</i>	Whole plant			<i>Aphis gossypii</i> , <i>Tetranychus viennensis</i> , <i>Pieris rapae</i> <i>Aphis glycinese</i> .
<i>Xanthium strumarium</i>	Fruit and whole plant	Xanthostrumarin		<i>Aphis gossypii</i> , <i>Tetranychus viennensis</i> , <i>Pieris rapae</i> , <i>Aphis glycines</i> ,

<i>Corydalis ambigua</i> <i>Schlecht. var.</i>	Whole plant	d-corydaline, dl-tetrahydropalmatine, protopine, 1-tetrahydrocoptisine, dl-tetrahydrocoptisine, Coptisine)	Toxicity	<i>Aphis glycines</i> <i>Vegetable aphides</i>
<i>Veratum nigrum L.</i>		Veratrin, Pseudojervine, Bubijervine, Colchicine.	Toxicity	<i>Aphis glycines</i> <i>Vegetable aphides</i>

2. Resources of Germicidal Weeds and its Present Situation of development

Investigation discovers that there are 77 species of botanical germicides pesticides which belong to 31 families. Among them, the most is Ranunculaceae which has 15 species in Changbai mountain area. On activity part, the active substantial have 38 speices on the

whole plant. Of these, active substantial have 26 speices in root, tuber and stem, 13 speices in branch and leaf, 3 speices in bulb, 4 speices in Fruit, seed and flower. There are the most kinds of prevention and cure of pathogen to Polygonum hydropiper and Phrymaceae, which up to 5 speices, the most kinds of inhibition to Moraceae and Caorus alamus, up to 5 speices.

Table 2. Weedy Species of Germicidal Botany in Mt.Changbai

Sci.name	Activity part	Disease prevention	Target pathogene
<i>Polygonum hydropiper</i>	Whole plant	Wheat leaf rust Wheat yellow rust Wheat stem rust Wheat smut Potato late blight	urediospore of wheat stem rust Cotton anthracnose conidia Wheat wheel spot conidia urediospore of wheat leaf rust
<i>Polygonum aviculare</i>	Whole plant	Rice blast	
<i>Rumex acetosa</i>	Whole plant	Wheat leaf rust Wheat yellow rust	Potato late blight conidia
<i>Rumex crispus</i>	Root	Wheat leaf rust Wheat yellow rust	Potato late blight conidia
<i>Rumex patientia</i>	Root	Wheat leaf rust Wheat yellow rust	Potato late blight conidia
<i>Portulaca oleracea</i>	Leaf	Wheat stem rust	Potato late blight conidia urediospore of wheat leaf rust
<i>Kochia scoparia</i>	Seed	Wheat stem rust	
<i>Aconitum coreanum</i>	Tuber	Wheat stem rust	
<i>Pulsatilla cerma</i>	Root	Wheat rust	urediospore germination of Wheat rust
<i>Ranunculus japonicus</i>	Whole plant	Rice blast	

<i>Sophora flavescens</i>	Root	Wheat leaf rust, Rice blast, Potato late blight	urediospore germination of Wheat stem conidia, cotton anthracnose conidia conidia, Germination of Apple anthracnose rust and leaf rust, Potato late blight
<i>Euphorbia fischeriana</i>	Root	Wheat stem rust Potato late blight Rice blast Black rot of sweet potato	
<i>Euphorbia pekinensis</i>	Whole plant	Wheat rust Wheat head blight	wheat leaf rust conidia, Cotton Fusarium wilt conidia, Cotton Verticillium wilt conidia, urediospore of wheat stem rust,
<i>Solanum nigrum L.</i>	Whole plant	Rice blast, Potato late blight	Botrytis cinerea conidia Wheat head blight, Tomato
<i>Patrinia scabiosaefolis</i>	Whole plant	Rice blast	
<i>Artemisia annua</i>	Stem and leaf	Wheat yellow rust	urediospore of wheat stem rust, endogenetic conidia of Black rot of sweet potato Potato late blight conidia,
<i>Artemisia apiacea</i>	Whole plant	Wheat stem rust Potato late blight	Antagonism of Cotton conidia, Wheat stem rust conidia
<i>Artemisia argyi</i>	Whole plant	Wheat stem rust	
<i>Taraxacum mongolicum</i>	Whole plant		Erwinia carotovora PV.carotovora
<i>Lactuca sativa L.</i>	Whole plant		Germination of Apple anthracnose conidia
<i>Xanthium L.</i>	Whole plant		Germination of Apple anthracnose conidia
<i>Pulsatilla chinensis</i>	Root	Potato late blight Rice blast Wheat rust	Potato late blight conidia urediospore germination of Wheat rust, <i>Bipolaris maydis</i> , <i>Exserohilum turcicum</i> , <i>Curvularia lunata</i> Boed., <i>Fusarium oxysporu</i> , <i>Rhizoctonia solani</i> Kuhn, <i>Alternaria alternata</i> (Fries) Keissler
<i>Corydalis ambigua</i> Schlecht. var.		Corn Leaf spot Corn Leaf blight Cucumber anthracnose Tobacco brown leaf spot	<i>Coniella diplodiella</i> (Speg.), <i>Bipolaris maydis</i> <i>Exserohilum turcicum</i>), <i>Curvularia lunata</i> Boed.), <i>Fusarium oxysporum</i> f. sp. <i>cucumerinum</i>), <i>Rhizoctonia solani</i> Kuhn), <i>Alternaria alternata</i> (Fries) Keissler
<i>Veratum nigrum L.</i>		Corn Leaf blight Cucumber anthracnose Cucumber <i>fusarium</i> wilt	<i>Coniella diplodiella</i> (Speg.), <i>Bipolaris maydis</i> , <i>Exserohilum turcicum</i> , <i>Curvularia lunata</i> Boed., <i>Fusarium oxysporum</i> f. sp. <i>Cucumerinum</i> , <i>Rhizoctonia solani</i> Kuhn, <i>Alternaria alternata</i> (Fries) Keissler
<i>Tripterygium</i>			<i>Bipolaris maydis</i> , <i>Exserohilum turcicum</i> , <i>Curvularia lunata</i> Boed., <i>Fusarium oxysporum</i> , <i>Rhizoctonia solani</i> Kuhn, <i>Alternaria alternata</i> (Fries) Keissler

Conclusions

There are a lot of Resources of Pesticide botanical in Mount Changbai area. Among them *Corydalis ambigua schlecht.var.*, *Veratum nigrum* L., *Pulsatilla chinensis*, *Tripterygium*, and *Sophora flavescens* were indicated higher toxicity activity to the Pathogens and insect pest.

The screen result showed : They were saw broad-spectrum antifungal and antifeedant activity. Antifungal activity. degree were *Corydalis chloroform* > *Pulsatilla chloroform* > *Pulsatillabutanol*. All the medicaments have the best of restrain effect to the *Coniella diplodiella* (Speg.) Petrak & Sydow, and the inhibition rate was 100% in the 200 mg/L of the *Corydalis chloroform*, and the inhibition rate was 100% to *Bipolaris maydis* and *Curvularia lunata* Boed in the 600 mg/L, and the inhibitory rate by *Veratum nigrum* L., *Tripterygium*, *Sophora flavescens* were higher than 50% to *Coniella diplodiella* (Speg.), *Bipolaris maydis* (*Exserohilum turcicum*), *Curvularia lunata* Boed.), *Fusarium oxysporum* f. sp. *cucumerinum*), *Rhizoctonia solani* Kuhn), *Alternaria alternata* (Fries) Keissler.

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