Exploration of Plants Protection Tactic and Current Situation in Ngari of Tibet

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Abstract. The method for this article is to count the total numbers, catalogs, plants coverage, and biomasses and make relevant conclusions by representative typical plot. In the meanwhile, exploring the possible external and inner reason for current life of plants in Ngari of Tibet. External possible reasons include the rough surroundings, unreasonable utilization of human, etc. The internal possible reasons include the ecological suitability, the competitive between plants and ecological niche relationship. In addition, the author puts forward specific measures and suggestions on how to improve and promote the growth of plants, for example, to reduce wind and sand disasters by selecting the suitable type of the species that protects against wind and sand, to improve the specialized legal law, to accelerate the distinctive ecological plants program in Ngari and to explore a more diversified development model. Region of Ngari, is the prefecture-level region in Tibet of China, and be located in north Qinghai-Tibet Plateau. Although It has an area of 345,000 kilometers, but because its hard and severe natural environment, quantity of various animals, including human, are very scarce in this area. Based on the principle of moderate methods equivalent to moderate place, this article will raise the concrete measures to explore reasons of rare quantity of plants in this region, and raise the logical suggestions to exploit and protect plants resources in proper ways.

1. Reason and current distributions of plants in Ngari.

1.1. Reason in natural and environment:

1.1.1. Unbalanced elements of ecology system. A integrated ecology system is composed by adequate producers, decomposers, and consumers. But because of its high levels and insufficient decomposers, excretions of animas won’t be broke down timely, resulting vast soil pollutions and decreasing space of living.

1.1.2. The frequent monsoon climate. In identical areas, team choses 3 plots, which be decorated by different desertification levels, to detect the different wind speed of surface.
Figure 1. The different wind speed of surface that have dissimilar plants in different desertification.

As is vividly shown in this picture, because of the different plants on surface, wind-speed also different. From 19 PM this afternoon, sunlight and radiation intensity becomes decreased gradually, along with the complex landform, making the air speed more and more fast, and moderate or strong gale comes along with it. Dunes and soils also has a tendency to move slowly. All those elements makes the living space of plants be compressed severely.

1.2. Human factors.
The irrational use by human beings is an important reason for the long-term failure of plant survival.

In recent years, with the strong support and assistance from the state for Tibet, the living standards of the Tibetan people have been significantly improved, and the per capita number of cattle and sheep has been increased. However, as time goes on, the contradictions between the environmental carrying capacity and the rapidly growing number of livestock are increasingly sharp. The regional economic industry is mainly animal husbandry, so the demand for grass is always great.

The number of livestock grass can carry isn’t reasonably controlled by the local farmers and herdsmen. They usually take dissolving development for the roots of plants. Take Shiquanhe Town in Ngari Prefecture as an example. Before the 1980s, there were large areas of forest and grassland resources in the Shiquan River Basin, including myricaria elegans royle, caragana versicolor and other solid-fixation plants. With the migration of rural population and the development of urbanization, in order to deal with the energy demand and improve farmers’ living standard, the local government called on farmers and herdsmen to cut trees resources and improve the level of grazing. In short time, the forest and grassland resources in the Shiquan River Basin have been exhausted, which accelerated the process of desertification.

Therefore, in general, the sparse vegetation distribution in Ngari Prefecture is caused by natural conditions and human unreasonable economic industrial activities.

2. Type and character of plants.
Herbage has the wide distribution, the second is shrub, the last is arbor.
Tab. 1 The representative plants of Ngari

| Name                        | Family              | character                                                                 | Habitat                                                                 |
|-----------------------------|---------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------|
| *Salix acerophylla* Anderss. | Willow family       | Shrub 30-200 cm tall, erect. Leaves leathery, elliptic to obovate. Capsules ovoid-conical, pubescent, flowering May. | Slopes in alpine belt at 4300-4800 m. A dominant species in alpine scrublands. |
| *Caragana versicolor* Benth. | Pea family          | Shrub 50-100 cm tall. Bark yellow-brown; branches dense. Leaflets 4, stipules hardened into an aceros spine on long branches, flowering June to July. | Slopes, foothills, and river beaches in alpine steppe to montane semi-desert zones, at 4200-4900 m. |
| *Salix bangongensis* C. Wang et C. F. Fang. | Willow family       | Arbor 2-5 m tall. Branchlets ascending or straight; roots deep and wide. Leaves relatively large, flat, oblong to obovate-lanceolate. | Slopes in river beaches and lakeside at over 4600 m. |
| *Polygonum sibiricum* Laxm.  | Buckwheat family    | Perennial herb 5-10 cm tall. Stem ascending or erect, branched, flowering June to August. | Sands, gravelly ground, rivers, at 3500-5100 m. |
| *Christolea crassifolia* Camb. | Mustard family      | Perennial herb 10-40 cm tall. Stems suberect, much branched. Leaf blades obovate, flowering June to August. | Gravelly slopes, dry riverbeds, at 3500-5100 m. A dominant species of alpine desert in west Tibet. |

3. Research methods
Team had done plants investigation in immovable experimental plots at Town Zhaxigang, Region Ngari of Tibet in July, 2015, and take gravel to put down sands. Adopting method that have 5 points to select experimental sample area with 1 square meter. And the same investigations were hold in 2016 and 2017.

Concrete items of research include species, the number of different species, plants coverage, Index of abundance and so on.

3.1. The number of species
Method: Using technical books and knowledge to identify the number of species.

3.2. The individual number of different species
Method: Counting with manual way after the number of species be confirmed.

3.3. plants coverage
Partial coverage: the projection area of certain species/partial sample area.
Global coverage: the projection area of certain species/global sample area.

3.4. Index of abundance
Adopting Margalef Index of abundance to count it.
Formula of index of abundance: \[ R=\frac{S-1}{\ln N} \]
S: The global number of species in sample area.
N: The global individual number of different species in sample area.
Tab. 2 The concrete distribution characteristics of plants in Town Zhaxigang of Ngari of Tibet.

| Year | Global number | Family | Genus | Selective plot | Number of the individual and global | Individual and global coverage (%) | Index of abundance |
|------|---------------|--------|-------|----------------|-------------------------------------|-----------------------------------|-------------------|
| 2015 | 4             | Grass family | Poa | 1,3            | 5(2+3)                             | 8.1/0.9                           | 0.6379            |
|      |               |         | litwinowiana |                  |                                     |                                   |                   |
|      |               |         | Ovcz. |                |                                     |                                   |                   |
|      |               | Mustard family | Stipa purpurea | 1,3,4          | 7(0+1+6)                           | 11.34/1.26                       | 0.5139            |
|      |               |         | Griseb. |                |                                     |                                   |                   |
|      |               |         | Christolea |                |                                     |                                   |                   |
|      |               |         | crassifolia |                |                                     |                                   |                   |
|      |               |         | Camb. |                |                                     |                                   |                   |
|      |               |         | Suaeda |                |                                     |                                   |                   |
|      |               |         | corniculata |                |                                     |                                   |                   |
|      |               |         | Bunge. |                |                                     |                                   |                   |
|      |               | Grass family | Poa | 2,5            | 4(2+2)                             | 6.57/0.73                         | 0.3074            |
|      |               |         | litwinowiana |                |                                     |                                   |                   |
|      |               |             | Ovcz. |                |                                     |                                   |                   |
|      |               | Mustard family | Stipa purpurea | 1,4,5          | 59(17+20+22)                       | 35.13/3.90                       | 0.7085            |
|      |               |         | Griseb. |                |                                     |                                   |                   |
|      |               |         | Christolea |                |                                     |                                   |                   |
|      |               |         | crassifolia |                |                                     |                                   |                   |
|      |               |         | Camb. |                |                                     |                                   |                   |
|      |               |         | Suaeda |                |                                     |                                   |                   |
|      |               |         | corniculata |                |                                     |                                   |                   |
|      |               | Shrubby family | Ajania | 1,4,5          | 9(1+3+2+3)                         | 13.45/1.49                       | 0.6588            |
|      |               |         | fruticulosa |                |                                     |                                   |                   |
|      |               |             | (Ledeb.) |                |                                     |                                   |                   |
|      |               |             | Poljak. |                |                                     |                                   |                   |
|      |               | Grass family | Poa | 1,3,4          | 10(2+3+5)                         | 24.03/2.67                       | 0.7241            |
|      |               |         | litwinowiana |                |                                     |                                   |                   |
|      |               |             | Ovcz. |                |                                     |                                   |                   |
| 2016 | 5             | Mustard family | Stipa purpurea | 1,2,5          | 6(1+2+3)                           | 10.19/1.13                       | 0.7112            |
|      |               |         | Griseb. |                |                                     |                                   |                   |
|      |               |         | Christolea |                |                                     |                                   |                   |
|      |               |         | crassifolia |                |                                     |                                   |                   |
|      |               |         | Camb. |                |                                     |                                   |                   |
|      |               |         | Suaeda |                |                                     |                                   |                   |
|      |               |         | corniculata |                |                                     |                                   |                   |
|      |               |         | Bunge. |                |                                     |                                   |                   |
|      |               | Horned family | Ajania | 1,4,5          | 72(29+17+26)                       | 42.87/4.76                       | 0.6684            |
|      |               |         | fruticulosa |                |                                     |                                   |                   |
|      |               |             | (Ledeb.) |                |                                     |                                   |                   |
|      |               |             | Poljak. |                |                                     |                                   |                   |
|      |               | Shrubby family | Poa | 2            | 1                                   | 3.83/0.43                        | 0.9102            |
|      |               |         | litwinowiana |                |                                     |                                   |                   |
|      |               |             | Ovcz. |                |                                     |                                   |                   |
|      |               | Grass family | Poa | 1,3,4,5       | 12(2+3+5+2)                        | 18.17/2.02                       | 1.4571            |
|      |               |         | litwinowiana |                |                                     |                                   |                   |
|      |               |             | Ovcz. |                |                                     |                                   |                   |
|      |               | Mustard family | Stipa purpurea | 1,3,4          | 13(3+4+6)                          | 31.2/3.47                        | 1.3237            |
|      |               |         | Griseb. |                |                                     |                                   |                   |
|      |               |         | Christolea |                |                                     |                                   |                   |
|      |               |         | crassifolia |                |                                     |                                   |                   |
|      |               |         | Camb. |                |                                     |                                   |                   |
|      |               |         | Suaeda |                |                                     |                                   |                   |
|      |               |         | corniculata |                |                                     |                                   |                   |
|      |               |         | Bunge. |                |                                     |                                   |                   |
| 2017 | 8             | Horned family | Chamaerhodos | 1,4,5          | 81(30+34+17)                       | 48.23/5.35                       | 1.0577            |
|      |               |         | sabulosa |                |                                     |                                   |                   |
|      |               | Rose family | Erodium | 5            | 4                                   | 11.76/1.31                       | 0.8909            |
|      |               |         | tibetanum |                |                                     |                                   |                   |
|      |               | Geranium family | Ajania | 4            | 6                                   | 1.75/0.2                         | 0.7881            |
|      |               |         | fruticulosa |                |                                     |                                   |                   |
|      |               |             | (Ledeb.) |                |                                     |                                   |                   |
|      |               |             | Poljak. |                |                                     |                                   |                   |
|      |               | Geranium family | Artemisia | 2,3          | 3(1+2)                             | 5.75/0.64                        | 0.3899            |
|      |               |         | wellbyi |                |                                     |                                   |                   |
|      |               |             | Hemsl. |                |                                     |                                   |                   |
|      |               |             | et Pearson. |               |                                     |                                   |                   |
|      |               | Shrubby family | Poa | 3            | 3                                   | 7.8/0.87                         | 1.3653            |
|      |               |             | Ovcz. |                |                                     |                                   |                   |
From this table, the amount of plants species in desertification region of Ngari remains have a fast growth tendency, and whatever in ever type of desertification, The *Suaeda corniculata* all grows well because of its small shapes and thick leaf blades. As the dominant species of desertification region, its amount grows 59 to 81 during 2015 and 2017, with an increase over 37 percent.

4. Summary and prospect
Although various plants have made enough changes in their ecological adaptability, the number of plant species and population density in Ngari hasn’t changed significantly, and the living conditions of plants are still severe. All in all, government should draw up more specialized legislations and laws so that a balanced and sustainable development will be track out.

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