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The basin traps in the northeast region in northeast China

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Abstract:- In order to study the Chinese northeast basin group in the northeast of trap distribution, and trap types and forming time. By seismic exploration in this area, the author of this paper several basin are studied, including the Sunwu-Jiayin basin, Yanji basin, Hulin basin, Boli basin, Jixi basin, Sanjiang basin, soup of the original fault depression, founder and Murray green fault. The results show that trap the region starting from the early cretaceous development is given priority to with structural trap, stratigraphic trap and lithologic trap less developed, from north to south, reduce gradually.

Keywords:- *Northeast China Early Cretaceous Structural trap Stratigraphic trap Lithologic trap*

I. INTRODUCTION

Trap is the basic unit of the oil and gas gathering in the basin, the correct understanding of trap distribution, to the study of oil and gas distribution regularity of the whole basin plays an important role. In northeast China refers to the eastern and northern Songliao basin in the northeast region, mainly including Sunwu-Jiayin basin, Yanji basin, Hulin basin, Boli basin, Jixi basin, Sanjiang basin, Tangyuan fault depression, Fangzheng and Moliqing fault[1]. In recent years, people in the oil and gas exploration in this region, but for the region of the basin trap type, distribution and formation time problems such as lack of systematic study, this paper tries to research on trap characteristics of these basin and provide scientific basis for oil and gas exploration.

II. TRAP TYPES

Due to the effect of different geological period of tectonic activities, in the eastern part of Songliao basin peripheral basin group of complicated geological conditions. In the tectonic geological background, the development has various trap types. The main trap types are structural trap, stratigraphic trap, lithologic trap and composite trap four categories. Various trap types of the basin are mainly composed of structural trap, stratigraphic trap and lithologic trap development is less, the composite traps for structural trap, lithologic trap and stratigraphic trap in which two or more composite trap, lithologic trap to give priority to (table 1).

Table 1 The eastern songliao basin peripheral basin group of trap types TAB

main type	type （ Genetic classification）	The class （Genetic classification）	Form the time	Representative Basin
Structural trap	Anticlinal structural trap	Squeeze the anticline	Squeeze the time	Jixi basin
		Inverse traction anticline	Fault depression period	Boli basin
		Drape anticline	With sedimentary period	Yanji basin
	Fault trap	Fault nose trap	Squeeze the time	Fangzheng fault depression
		Fault block traps	Fault depression period	Fangzheng fault depression
Stratigraphic trap	Buried hill trap	_____	With sedimentary period	Moliqing fault depression

	Stratigraphic unconformity trap	_____	During the sedimentation of the initial	Sunwu - Jiayin basin
	The stratigraphic overlap trap	_____	During the sedimentation of the initial	
Lithologic trap	Reservoir rock updip pinchout trap	_____	Squeeze the time	Fangzheng fault depression
	Lens lithologic trap	_____	With sedimentary period	Hulin basin
Composite trap	Structure-lithology trap	_____	_____	Tangyuan fault depression
	Structure - stratigraphic trap	_____	_____	Fangzheng fault depression

III. THE DISTRIBUTION REGULARITY OF TRAP

3.1 Trap plane distribution characteristics

Located in Yishu graben, tangyuan and angzheng fault depression and Murray green fault depression affected by tectonic fracture activity is stronger, fault development, therefore traps more is given priority to with fault nose trap (Fig 1); Located in the northwest of the Sunwu-Jiayin basin basin early fracture development, advanced extrusion strongly, more anticline traps formed, faulted anticline and fault block (Fig 1);Sanjiang basin, Hulin basin[2], Boli basin, Jixi basin formed a large number of fault block in fault depression stage, late in the structure of the reverse process, extrusion and thrust, as many broken nose and Hulin basin in the Sanjiang basin and anticline traps. While Yanji basin mainly fault nose trap. Overall, the northern basin group is given priority to with anticline and faulted anticline traps; The eastern basin group is given priority to with fault block and fault nose trap. Anticline and faulted anticline from north to south has a tendency to reduce. And fault nose and fault block from north to south has a tendency to increase. That is to say, faulting enhance from north to south, preservation conditions.

Look from the trap area, trap area size can be divided into three categories: Ⅰclasses: area of >40 km2 ; Ⅱclasses: area in 15 to 40 km2; Ⅲclass: area of < 15 km2 (according to Li Zhongquan). Most visible trap area mainly Ⅲclass; Trap area gradually decreases from north to south, the number of trap increase gradually, cause fracture density increases from north to south, strong tectonic activities, and preservation conditions, formation and broken degree increase(Fig 2).

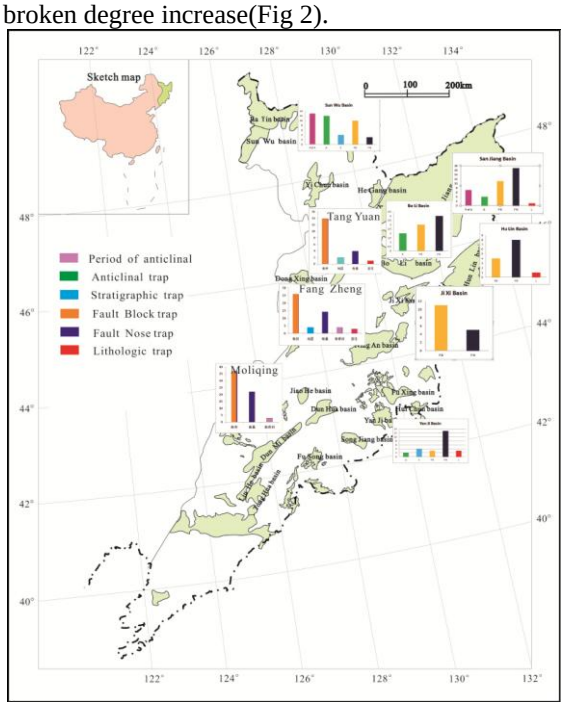

Fig 1 Trap type plane distribution map

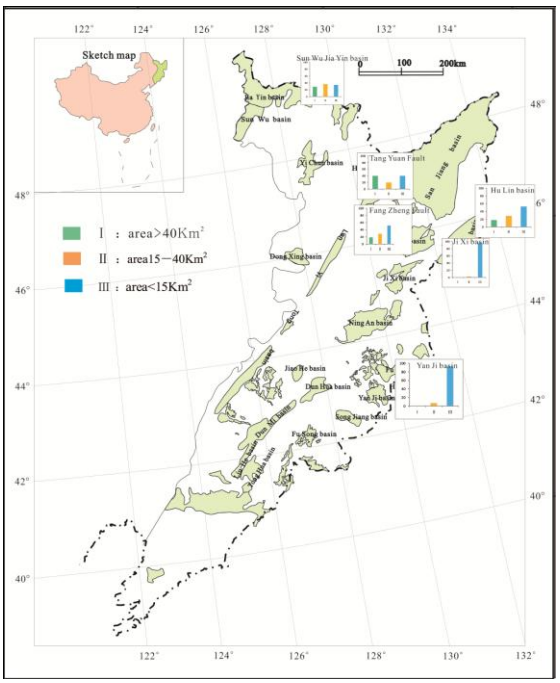

Fig 2 basin trap area map

3.2 Longitudinal distribution characteristics

Vertically, the traps are mainly developed in the lower Cretaceous, Upper Cretaceous strata and the ancient near.The tectonic activities of the above strata are strong, and the traps are distributed along the fault.The more intense activity area, the development of the trap is also more, the trap area is small, the closure degree is low.In the control of the fault of the basin near the trap closure area distribution, while the distribution in secondary faults in the vicinity of trap closure area and closure to relatively small multi and distribution is relatively concentrated, the reason is strong fracturing the formation broken seriously.

IV. TRAP FORMATION PERIOD

Different types of trap formation time. The lithologic trap formation is in the occurrence of the strata has start to form a closed condition, for the same strata in the trap, lithologic trap formation is the earliest time. Hulin basin, Yanji basin, lithologic trap in Sanjiang basin and so on, its formation period to the early stages of basin formation. Stratigraphic unconformity trap is above the unconformity surface formation has a closed form, With Sunwu-Jiayin basin as an example, the late early cretaceous formation of large area regional unconformity, constitute a blocking effect, the formation of stratigraphic overlap traps and unconformity trap. Synsedimentary anticline traps, such as only the inverse anticline and traction anticline, etc., is gradually formed in the process of deposition.

Compared with these types of trap, a large number of structural trap is formed in the process of the late tectonic movement. According to the peripheral basin, songliao basin group of experienced several tectonic activities (according to Jia Chengzao[3]), can be broadly determine the formation of structural trap.

4.1The early cretaceous

The early early cretaceous, Songliao basin, east of north of medium and small fault basin group of mostly in the rift stage, the tectonic framework of formation are often controlled by the north east to fault. At this time of the tectonic activity is given priority to with faulting, common development in this period have fault block trap, fault nose trap and so on, are mainly distributed in the footwall fault. At the same time, due to the slump (fan) delta front sand body, formation of gravity flow, into the lake, the formation of lithologic trap.

4.2The middle of the early cretaceous

Early Cretaceous, Jixi Basin, Boli Basin, Hulin basin in mid depression depression stage, the stage of weak tectonic activity, but active fault controlled basin deposition.During this period, the Sanjiang Basin as a whole constitute a depression depression belt, trap formation and early Cretaceous similar, dominated by lithologic traps and development has a broken nose and anticline traps.

4.3Late early cretaceous

Late early cretaceous, peripheral basin group of northeast Songliao basin has experienced the regional tectonic inversion effect for the first time, from breaking into a sag basin nature, formation liquid into a series of thrust nappe, before MuLing group and the formation of wrinkles. Under the action of lateral extrusion stress, Jixi basin, Boli basin has large thrust fault development, and the formation of the corresponding extrusion anticlinal trap, fault activity related fault block and fault nose trap and so on.

4.4The late cretaceous

The late cretaceous of Songliao basin mainly by the north east, south west to squeeze. Big Sanjiang basin group of unconformity in all aspects of the monkey stone ditch under the older strata above, at this time and tectonic activities at the same time, can form stratigraphic trap or structure - stratigraphic trap. Due to squeezing effect of continuous, formed a series of nearly east-west north-south extrusion, thrust, and the thrust fault is formed by compressional anticline traps and reverse fault block out a large number of fault nose and fault block traps.

4.5 Since the paleogene system

Tangyuan tectonic depression, Fangzheng fault depression of Yitong Basin and the development history of research shows that (according to Yang Haibo[4], Luo Qun[5]),Located in Yishu graben within each fault depression, the formation and evolution of the structure is given priority to with extending action, therefore in the mainly extensional fault, transtensional normal fault is given priority to, and control the rift sedimentary, Trap formation is associated with the blocking effect of normal fault, the late development of the early compressive thrust fault along the normal fault back to the form, distribution in the eastern part of the rift, can form extrusion anticline or fault anticline traps. The formation of trap issue mainly have three:

Xin'an village + cloud group to reach even the river sedimentary period, the period of the fault activity is given priority to with strike-slip stretching deformation, the formation of traps is closely related to normal fault

blocking effect, control fault boundary of two large fracture formation and activity, the formation of trap area is generally larger.

Darien river - Baoquanling sedimentary period, strong activity in accordance with the han tong fracture, during this period of strata control, fault is given priority to with normal fault, shear deformation and boundary faults formed near the fracture associated with numerous, forming many small trap, trap types are mainly composed of fault nose and fault block, closed area under 10 km2 in more.

After the deposition of the Fujin formation, the deformation of the basin is squeezed and the reverse fold occurs, which is the character of the deformation of the compression and torsion.

V. CONCLUSION

A, Each basin trap types are mainly composed of structural trap, stratigraphic trap and lithologic trap development is less, the composite traps for structural trap, lithologic trap and stratigraphic trap in which two or more composite trap, lithologic trap to give priority to.

B, Anticline and faulted anticline from north to south has a tendency to reduce. And fault nose and fault block from north to south has a tendency to increase. Trap area gradually decreases from north to south, the number of trap increase gradually, can show that tectonic activity from north to south gradually enhanced.

C, Back to the early early cretaceous lithologic trap to middle with lithologic trap is given priority to, concurrent with a broken nose and anticlinal trap, then gradually formed extrusion anticlinal trap, fault activity related fault block and fault nose trap and begin more shows that tectonic activity.

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